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Military Review

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TIME AS A CONCEPT IN MILITARY STRATEGY

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THE question of whether time works for the West has been much discussed, although without a final consensus. It is a question which would receive different answers depending upon the time period considered, for the tempo of progress in military capabilities is not a steady one.

With a limited military budget, no matter how large, it is not possible to buy complete security at all times against any contingency. Expenditures must be so scheduled over time, and so distributed among military end items, and between military manpower and weapons and matériel, as to provide reasonable security during future periods of anticipated maximum risk: periods which depend largely on our own estimates of the potential enemy's preparedness over time, as well as the enemy's motives and objectives.

Expenditures must be allocated to provide the kind of military power best suited for meeting the type of emergency most likely to occur, as well as the type of emergency for which the cost of unpreparedness is exhorbitant. This is not a simple matter, since the type of emergency most likely to be thrust upon us, as well as the time of its occurrence, in turn depend upon the resources in being available to cope with it and on the nerve to use them. The prophet honored proves false, for our precautions may prevent fulfillment of his prophecy.

These three aspects of military time in a historical sense—the long-range trend in relative military potentials of Russia and the West, the variations over time of risks of various types of war, and the fluctuations over time of relative military power—are mentioned only to exclude them explicitly. It is not this facet of time—its historical aspect—which will be discussed, but rather time as a dimension in planning: the scheduling of future procurement, availabilities, and dispositions of military resources.

The intelligent planning and conduct of a war, whether it be a war actually in progress or one expected at a definite future date, requires an estimate of its expected or probable duration. On this time estimate hinges first the resources available for prosecution of the war and, therefore, mobilization planning and execution; and second, the extent and type of vulnerability and, as a consequence, defense and target priorities. It is this aspect of time, the expected duration of an actual or imminent conflict as an essential variable in strategy, which is considered.

Vulnerability

The type of vulnerability discussed is not the physical vulnerability of a target to some method of attack, but the military-economic vulnerability of a country to any method of attack. Given the ability to wreak damage on its physical installations, where is the country most vulnerable? Destruction or damage of which installations will most seriously reduce its

It is the aspect of time—the expected duration of an actual or an imminent conflict as an essential variable in strategy—which must be considered in the intelligent planning and conduct of any future war

actual ability to wage war? The most vulnerable points, and the least vulnerable points, in a country's economy are one thing in a short war, an entirely different thing in a long war, and something else again in a cold war. In a hot war its expected duration is the most important single determinant of vulnerability.

Destruction of a facility will reduce the military effort of the enemy only if reserve plants and reserve capacity are already utilized. There will be a timelag in effect equal to the sum of production time periods of all successive stages of production from the product whose output has been denied to the end product(s) of direct military use, plus the time necessary to use up existing stockpiles of both intermediate products plus final products. (Stockpiles are defined as supplies in excess of minimum operating inventories, and their sizes are defined in terms of the amount of time they will last.) When complementary products are used in a single stage of production (for example, iron ore, coke, and limestone in the manufacture of pig iron), it is the smallest stockpile that determines the timelag in that stage. Excess supplies of other complementary goods remain as unusable surplus.

Conversely, when a single product undergoes several stages of processing beyond the interdicted stages, it is the largest stockpile that determines the timelag, since it will be processed into stockpiles of equivalent size at further stages of production. To the time required to process this largest stockpile into end items must be added the time required to convert into end products the sum of all the earlier stockpiles past the stage of interdiction starting at the same stage of production as the largest stockpile. This apparently complicated computation is greatly simplified by the fact that the number of inventories between the stage of interdiction and the final product usually is very small. This is particularly true when most steps in production are carried out in a single integrated plant.

The duration of the direct effects on the military effort depends on the time necessary to convert inessential facilities to produce the items whose plant has been destroyed, or to construct replacement plants and equipment, less the stockpile consumption timelag in the initial effect on military effort. For immediate effect, therefore, a facility should be destroyed whose product is directly used in the military effort and which is not stockpiled for more than a few days. Even more immediate effects can be obtained by destroying stockpiles of military end products—soldiers, munitions, airfields, rations—or by preventing their transfer from passive to active status through interdiction of transport. Destruction of productive facilities has a more permanent although less immediate effect than destruction of stockpiles.

Three Categories

In brief, the criterion of vulnerability can be broken down into three categories:

1. The immediacy of the effect on military power.
2. The intensity of the effect.
3. The duration of the effect.

Immediacy of effect varies inversely with production time for the item interdicted plus production times for all products intermediate between the item interdicted and the military end product, inversely with the size of stockpiles of the item interdicted, of all items intermediate between it and the military end product, and of the military end product itself.

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The intensity of the effect depends *first* upon the existence of reserve plants or unused capacity in operating plants and equipment; *second*, upon the essentiality of the product itself; *third*, upon the feasibility of substitute products made by other facilities; *fourth*, on the feasibility of converting other facilities to making the item interdicted; and *fifth*, if either substitute products or substitute plants are practicable, on the availability elsewhere in the economy of inessential facilities and equipment which can be converted to making the item or its substitute.[1]

The duration of the effect depends on conversion time for alternate facilities or upon construction time for the replacement of plant and equipment, less consumption time for the excess stocks on hand at the time of interdiction of the interdicted item, of all items intermediate between it and the final military product, and of the military end product itself. It is assumed that less essential facilities exist which can be converted, or that new plant and equipment can be provided, if necessary, by deferring less essential construction. If this is not the case it follows usually that the loss incurred is not considered serious.

Types of War

A short war is fought with stocks only and any destruction of productive facilities is useless in influencing its outcome.[2] The *maximum* time period a war *can* be fought with stocks alone depends exclusively on their level and on the rate of their utilization, which varies of course for different items, being perhaps years for some, days for other items. The *minimum* period in which a war *must* be fought with stocks only is the timelag between production of the end item and its actual use in war. Since the rate of utilization of end items at the beginning of a war usually exceeds the rate at which they are being turned out, there is a longer period in which either the war effort must be restricted while production increases, or reliance must be had on initial stocks, both the stocks and the reliance on them diminishing as production rises.

The *maximum* period in which war *must* be fought with stocks, the case of zero initial production, is the time required for conversion and/or construction of productive facilities, plus the time required to produce the end item and deliver it to its users. In actuality, the initial reliance on stocks, and the decreasing reliance on stocks as production gradually increases, can be expressed at any period in the course of the war as a ratio of current production over current consumption of the end items (with a suitable lag for delivery from plant, and from stocks, to the final users). The longer the expected duration of a war, and the more intensive it is expected to be, then the greater the importance of productive facilities relative to stocks as determinants of the war effort. A short war, defined as one fought with stocks alone, can be expressed in terms of time only if initial levels of stocks and rates of utilization are known.

A war expected to last an intermediate period is fought both with stocks and with wartime output. The intermediate period is defined to be long enough to permit existing facilities to attain their maximum rate of output and short enough to preclude large increases in production from major conversion of inessential facilities and construction of additional facilities. In a war of this expected duration the capital equipment, labor skills, and weapon types are assumed to remain unchanged. As this period becomes longer, the war effort is more and more limited

[1] Carl Kaysen, "Vulnerability of the U. S. to Enemy Attack," *World Politics*, Volume 6, January 1954, p. 197.

[2] Bernard Brodie, "Implications for Military Policy," *The Absolute Weapon: Atomic Power and World Order*, Yale Institute of International Studies, New Haven, 1946, p. 79. T. F. Walkowicz, "Strategic Concepts for the Nuclear Age," *Annals*, American Academy of Political and Social Science, May 1955, p. 121.

by the level of production. The importance of stocks as a limiting factor depends entirely on their size relative to rate of consumption on one hand and of production on the other. Only as long as they are large in terms of consumption do they permit a greater effort than current production justifies.

A long war is one expected to last long enough to permit conversion of facilities and construction of new facilities to the required level. There is no maximum which can be specified in general terms, since the longer the expected duration the slower can be the buildup process, although this need not take place. The minimum period compatible with the definition of a "long war" depends first, upon the gap between the initial level of war production and the desired level; second, upon whether conversion or new construction is required to bridge the gap; and third, upon the resources which can be spared for expanding productive capacity.

Priorities

The expansion of war-waging capacity competes with the war production for manpower (particularly skilled manpower), for materials, and for plant and equipment. The allocation problem is simple in a short war fought exclusively with stocks, still relatively simple in an intermediate war fought with stocks and the production of fixed plant, but quite complicated in a war long enough to allow the choice between allocation of manpower and resources to war prosecution, to war production, and to the expansion of war production capacity. If the massive use of manpower and military end products in war can be deferred for some time, as in the case of the Western Allies in World War II between Dunkerque and D-day, then current production of end items can be held back for the sake of expanding capacity for future production, and the use of military end items can even be deferred until not only capacity has been raised, but stocks of items produced by this added capacity have been built up.

World War II reveals a story of shifting emphasis in the US: priority on conversion and addition to munitions capacity in the early war period, shift to output of war goods in the intermediate war period, with munitions employment declining by 1944, and then a shift of manpower to the military effort, with the armed forces reaching their maximum in mid-1945, well after reconversion of industry to civilian production was largely completed.[3] *These three successive efforts could not have attained the same level had they been pursued simultaneously.* For the US it was possible to space out these separate programs and avoid, therefore, too serious a problem in allocation of scarce resources to competing ends. In the case of the USSR it was necessary to pursue these aims simultaneously—USSR resources were not adequate and had to be supplemented in large measure by American aid.

Divergent Views

During World War II devotees of victory through airpower were mostly ranged somewhere between the two extreme views on the nature of economic vulnerability: the Achilles' heel view which held that each economy had some plants, typically the ball-bearing plants, whose destruction could be accomplished with a small effort and whose loss would cripple the country's war-waging ability; and the mass, not to say the indiscriminate bombing view, advocating the destruction of large urban industrial complexes, which denied the existence of highly vulnerable Achilles' heel plants. The latter view did not maintain that the effects of such across-the-board bombing would be restricted to the direct loss of output and productive facilities,

[3] C. D. Long, *The Labor Force in War and Transition—Four Countries*, National Bureau of Economic Research, New York, 1952, pp. 16ff.

but the cumulative effects it anticipated from bombing urban-industrial complexes was the result of geographical interdependence rather than functional interdependence.

The first view may be called the vertical, and the second the horizontal, approaches to vulnerability; as such they do not conflict. The second view is complicated by the possible psychological effects of mass bombing of cities—terror on one hand, stiffening of resistance on the other; and by the disrupting effects on the country hit of humanitarian concern for the stranded urban population.

Neither extreme view can be accepted. Against the Achilles' heel concept it can be pointed out that an advanced economy, unlike an advanced organism, has greater regenerative powers than a simpler, more rudimentary economy; it has greater interchangeability of process, plant, and manpower. It is difficult to find a product vital to the war effort which is made in only one or two plants, with no excess or idle capacity; a product with no substitutes, no alternative source of supply, and small reserve stocks. Only a very improvident nation has no cushion for its vital needs.

This same point also applies against the indiscriminate bombing of urban-industrial complexes. Unless the targets are selected with a view to concentration on facilities particularly hard to replace or to substitute, the effects of the attack need not cumulate to any great extent. And clearly, all industrial complexes are not equally indispensable, equally irreplaceable, equally lacking in reserve capacity. The advent of nuclear weapons has greatly reduced the significance of the dispute, and tilted it in favor of city-busting for which nuclear bombs are ideally suited. Whichever view is adopted or whatever middle ground is chosen, expected duration of the conflict remains a vital determinant of vulnerability.

The Fate of Cities

An important inference from the nature of a short war is that destruction of urban concentrations will have little effect on its outcome. It cannot be concluded that cities will not be attacked at all; however, they will not be primary targets. It is widely recognized by now that the offensive power in being will be the first priority target in such a war—first in time as well as in emphasis.[4] It is assumed, of course, that military forces, facilities, and supplies in being will not be located within the target area of major cities. If it is argued that the bulk of a nation's retaliatory force will survive initial air attack, then if the nation attacked has a large retaliatory force, it must be concluded that other more effective means of neutralization must be developed before any aggressor is willing to strike, and will be employed before the cities, centers of long-run military potential but irrelevant targets in a short war, are attacked.

Even if the attacker develops nearly 100 percent effective air defenses and, therefore, finds it unnecessary to destroy bases and facilities of its opponent's strategic air force, there is still no military purpose in city-busting. For the case of 100 percent air defense combined with large delivery capabilities amounts to a situation of nuclear weapons monopoly; the aggressor can then obtain most of his objectives by an ultimatum combined with demonstration attacks.

Comparison

There are strong reasons to believe that Russia will not dare attack the US until she believes herself capable of destroying most of the US retaliatory capability on

[4] R. Aron, "Europe and Air Power," *Annals*, American Academy of Political and Social Science, May 1955, p. 95. J. E. Kieffer, *Strategy for Survival*, David McKay Co., New York, 1953, p. 170. E. J. Kingston-McCloughry, *War in Three Dimensions*, Jonathan Cape, London, 1949, pp. 132ff. Walkowicz, *op. cit.*, pp. 124-125. W. L. Borden, *There Will Be No Time*, The Macmillan Co., New York, 1946. Chapter IV.

the ground before she can launch a counterattack. Russia's unwillingness to trade nuclear destruction with the US rests on a stabler and more lasting foundation than the fear of stalemate or risk of defeat. There is a maximum amount of damage which a country can endure and still survive; this maximum is much greater for America than for Russia. There is a minimum tolerable size of military forces and degree of internal control required for national survival; this minimum is low for the US but very high for Russia.

The United States might lose the majority of her population and all her large cities and yet survive as a society and as a state. It might be necessary to abandon for some decades the greater part of the country, concentrating the surviving population in a few compact regions, thus minimizing the large social overhead required to maintain communications and commerce, in order to permit the resumption of a high level of culture, technology, and welfare.

For Russia such high losses in population and productive facilities would prove intolerable, resulting in the disruption of Soviet society and dismemberment of the USSR. Soviet society, although strong, is not seamless. Great Russians comprise barely half the population of a state known since Czarist times as the "gaoler of nations." They are heavily concentrated in the larger cities and would suffer, therefore, disproportionate losses. Many of the subject peoples are restive and, as we learned in World War II, when a number of peoples were exiled to the interior of the USSR because of their aid to the Germans, will turn against the Russians when they can.

Russia, furthermore, is surrounded by many nations, both satellite and free, all of which have territorial claims or ambitions against portions of the USSR. Finland, Poland, Czechoslovakia, Romania, and Germany all have ceded territory to the USSR as recently as World War II and after. Estonia, Latvia, and Lithuania were absorbed. China lost control over Mongolia during the same period. Japan, although not a border country, strictly speaking, also has territorial ambitions in the Maritime Provinces. A number of the peripheral countries have a long history of enmity toward the Russians. Iran and Turkey have been confronted with Russian ultimatums since the last World War.

If the power and peripheral control of the USSR is permitted to fall too low, it will be faced simultaneously with internal anarchy and a revolt of subject peoples, and attack by sovereign peoples across its borders. The Russian Empire would then be in danger of shrinking to the proportions of a somewhat bloated Duchy of Muscovy. Such a catastrophe would, this time, be irreversible.

Diversionary Attacks

Some attacks on cities undoubtedly will be attempted, as feints or diversionary tactics, with the objective of compelling the enemy to disperse and dilute his defenses thereby increasing his vulnerability at primary targets. This objective can be achieved with few attacks and, since from the attacker's standpoint it is a diversion of offensive potential from more important targets, it will not be permitted to absorb more than a small fraction of his offensive effort, lest it reduce his chances of victory. Since Russia cannot be expected to launch a major attack without expectation of a quick and clear-cut victory, it seems likely that most of our cities will be safe for the foreseeable future.

Looking very far ahead, to a day when the US and the USSR will no longer be the only possible antagonists in an all-out war, and many nations will have nuclear weapons and delivery systems, the situation becomes more complex and indeterminate. Even a small nation might, if suicidally led, alter radically the relative

positions of the great states, at the cost of its own existence. Suicidal leadership is not impossible and, in small nations, could pass overlooked as it cannot ever be overlooked again in a major state.

The safety of our cities is such an important consideration over and above their military contribution that other motives for their destruction—and, therefore, reasons for their defense, no matter how remote—cannot be ignored. These include genocide, which cannot be ruled out altogether as we have too many historical examples of such policies. However, the desire to capture productive facilities intact (insofar as they do not have time to contribute to the war effort) with the consequent sparing of the urban populations, whether to operate these facilities or only to dismantle them, seems overriding. In a short war the only important effect of massive attacks on cities is on the rate and level of recuperation after the war. Massive attacks on urban concentrations will only be undertaken in a war expected to be of short duration as part of the aggressor's long-range political grand strategy, not as a part of his war policy, and only after he feels assured of victory through elimination of retaliatory forces in being.

Military Potentials

It has been shown how strategic vulnerability and, consequently, both target selection and defense priorities, are dependent on the expected duration of a war. Next will be discussed the dependence of the type and amount of military resources available for war purposes on the expected duration of the emergency. Military potential is not the obverse of strategic vulnerability, since not all resources of potential military value are vulnerable. In addition, most targets in a short war are of value for their offensive capabilities, whereas some important short-run military resources are only useful for defensive purposes. Furthermore, the main such resource, mass manpower, can be used to contribute only to long-run potential.

The extent to which a country can divert its productive resources to war effort, in a short-run period of one or more years, depends on the extent of its reserves. These include stockpiles of essential civilian goods in the hands of the ultimate consumers and the distribution of these goods; inventories in the hands of middlemen; stockpiles of raw materials and intermediate products; reserves of plant, equipment, and machinery, including use of discarded equipment and techniques, more intensive utilization, deferred replacement and maintenance; and labor reserves, including additions to the labor force and longer hours, as well as reserves of military supplies and the trained men to use them.[5]

Neither current military output nor capacity for production of basic materials is an adequate measure of potential military production and supplies in an intermediate period of several years. A consideration growing in importance with lengthening of the timescale is end product allocation to civilian versus military use and the extent to which diversion of existing stocks and productive facilities to military use is possible. Diversion potential should be considered separately for key materials, key labor, and key productive facilities. Insofar as the civilian uses from which production is diverted do not use the same ratios of labor to equipment to materials, conversion may be hindered by bottlenecks and may result in idle resources.

Physical limits to military production are imposed by plant and equipment, by labor, and by materials availability. Where a large part of the industrial plant is

[5] Sherman Kent, *Strategic Intelligence for American World Policy*, Princeton University Press, Princeton, N. J., 1951, pp. 46-55. Klaus Knorr, *The War Potential of Nations*, Princeton University Press, Princeton, N. J., 1946.

operated on a one-shift basis, it is labor which generally is the limiting factor, although in some areas transportation and raw materials also may impose limits short of the potential of plant and labor force. Other limits, which may be called psychological, prevent attainment of physical capacity. They include geographical and occupational immobility of labor, restrictions on the size of the labor force and on the amount of work done by individuals, and attitudes toward the employer and his welfare and toward the relation of effort and reward. Lastly, political limits are implicit in the attitudes toward the war and its goals, and explicit in the minimum living standard which will be tolerated without reducing war output.

Ultimate Military Resource

The ultimate military resource of any nation is its manpower. It can be converted, in time, and with widely varying efficiency, into any required skill or substance. The difficulties of adapting the labor force to war requirements—such as changes in location, specialization, and size—are also reflected in the problems of converting and enlarging plant facilities for munitions output.

The maximum withdrawals from the labor force to the military effort vary greatly depending upon the time period during which full mobilization is expected to last. All able-bodied males can be called in for emergency service during a very short initial period. The value of such a mobilization is very limited since the manpower must be used within a small radius of its place of residence at the time of mobilization and since most of it is untrained. In an advanced industrial nation the period during which all able-bodied males can be drafted for military service without creating chaos is so short—only a few days—that it is shorter than the time needed to complete their effective mobilization and is, therefore, unrealistic.

Although not practicable for military action, it is feasible for short-period disaster service, for simple construction, clearing, mass evacuation of population and supplies, and other operations which can be handled by raw manpower with simple organization. It need not be restricted entirely to the able-bodied for military purposes, nor to males. Indeed, the main contribution which raw manpower *in situ* can make has value only for a protracted war: this is the evacuation of the population, and of some vital supplies and equipment, thus preserving war potential and reconstruction potential for the future.

For a somewhat longer period of mobilization it would be necessary to maintain not only essential services such as health, public utilities, and fire and police protection, but also supplies of essential goods, primarily food, whose consumption cannot be deferred and whose stocks in the hands of many ultimate consumers are small. This time period, and, therefore, this corresponding level of manpower withdrawal, is set by available stocks of items such as fuel and food which have to be consumed daily. Some portion of the mobilized manpower may be used at some distance from its place of induction, and some, already trained, may be employed for strictly military purposes.

A longer time period, and corresponding to it a somewhat lower level of mobilization, involves production of single-use goods (consumed forthwith, like food, not slowly, like a car) of daily or almost daily necessity, but foregoes production of single-use goods whose frequent consumption is unnecessary (or whose stocks are large) and of durable goods (consumed over a long time period) whose replacement can be deferred (unlike replacement of food and fuel stocks). This is the shortest mobilization time period which is realistic from the standpoint of military manpower potentials. Its limit is set by

available stocks of durable goods and equipment, stocks of replacement parts, and possibilities of extending their useful life. Various gradations in time and in levels of mobilization are then possible as replacement of successive categories of essential durables becomes necessary, each gradation increasing the minimum size of the civilian labor force and, therefore, reducing the maximum withdrawals to the military at the same time that it lengthens the period during which such mobilization can be maintained.

Initial localization of the population becomes of less and less significance with the passage of time, although large redeployments reduce the maximum withdrawals for military service by increasing the needs for civilian labor in providing transport, facilities, and services in areas of major redeployment. The military effectiveness of the mobilized manpower depends upon the number with previous military training, the availability of adequate stocks of weapons and equipment, and, with the passage of time, on the rate of military training and of current production of necessary military end items.

Level of Mobilization

Eventually a level of mobilization is achieved which can be maintained indefinitely; it allows for provision of all essential needs of the country, both immediate and long run. Even this extreme (as well as other mobilization levels) can be broken down for various assumptions on the level of munitions production and, therefore, of employment in munitions and munitions-supporting industries. Another breakdown, in terms of alternate minimum tolerable levels of consumption, can be made which is independent of the level of mobilization to a considerable extent, since most of the population remains civilian in any case. It is not completely independent, for the level of consumption affects productivity in general, including productivity in munitions industries and, indeed, in other essential employments, which by definition means total employment in a fully mobilized war economy. Maximum war effort is attained not at the point where transfers of labor and resources to war production begin to lower productivity through reductions in living standards, but at the point where the increased resources in war production and the reduced productivity just cancel out.

No allowance need be made for residential housing, which certainly could be postponed for quite a few years if absolutely necessary unless there are major geographical shifts in population. Neither need allowance be made for repairs and replacement of plant and equipment in agriculture, consumers goods industries, transportation, and utilities, which can be put off for several years (but not indefinitely) without allowing capacity to fall below minimum tolerable levels. The labor needs for these purposes in a long emergency period depend upon the initial state of residential housing, of plant and equipment, and of the amount of productive capacity in agriculture, transportation, utilities, consumers goods, and other essential sectors of the economy in excess of minimum output needs in an emergency. If capacity is well in excess of minimum needs, then plant and equipment can be allowed to deteriorate for many years without replacement or major repairs.

The ratio of military supporting to military manpower in the armed forces also depends upon the expected duration of the emergency. If it is expected to be very short, there is no time to turn out large amounts of munitions and the country will have to rely on accumulated stocks; if it lasts at least a year or two, it is possible to convert from civilian to military production in time to influence the outcome. If the emergency is expected to last three years or longer, the construction of new facilities becomes practicable, with a cor-

responding increase in the labor force engaged in war production. Reduction of civilian production to minimum essential needs may, therefore, release resources for building new munitions capacity in the long run, or for converting civilian capacity to war production in an intermediate period. However, it will only lead to unemployment in the short run, when there is no time to absorb new workers in munitions plants still unbuilt (nor to train workers in needed skills which may be in short supply), nor time to manufacture weapons for civilians released from unessential employments, nor time to train them to use these weapons.

Cold Wars

A cold war can be distinguished from a hot one primarily in terms of the methods employed. First, the limitations on cold war methods does not restrict the range of targets although it may affect their relative physical and economic vulnerability and does greatly inhibit the methods of attack. A second distinction is that a cold war is expected to last a long and indefinite period—longer and more indefinite than the expected duration of hot wars. A third distinction may be in objectives. The aim of a hot war is military defeat of the enemy or at least the best military performance vis-à-vis the enemy. The aim of a cold war may be preliminary advantages which can be exploited in a hot war; it may be the avoidance of a hot war, whether directly or as a byproduct, by achieving the same ultimate aims through nonmilitary means. A cold war, however, may have quite a different aim: to redirect the objectives of the enemy, by striving for a change in heart, whether through conversion or revolution, thus eliminating the cause of wars, both hot and cold.

Economic vulnerability in a cold war bears some analogy to the same concept in a hot war only in the first two cases mentioned: cold war as an alternative to, or as preliminary to, a hot war (but not preparatory in any direct sense; that is, not the same thing as an armaments race, but as the prosecution of war aims by means short of war). Stocks are of reduced importance; if cold war is an alternative to hot war, stocks of military end products lose all relevance. Even if it is a preliminary to war, because of the indefinite timing of hot war, obsolescence of stockpiled end items reduces their importance. Strictly speaking, as means to hot war only, they have no more than a psychological bearing on a cold war.

Other differences between cold and hot wars follow from the longer and less definite expected duration of the former. Modern war cannot be prosecuted vigorously for many years; a very long war would lapse periodically into cease-fires and cold wars. Even in a long war, therefore, the growth of war production and potential is the result of reallocation of essentially fixed resources to war purposes. In a cold war of long duration, the growth of the total resources becomes important. Also, in a cold war the conflict between increasing output of end items and increasing capacity to produce them is less sharp partly because of the lengthened temporal scale which permits recurrent alternation in time and which reduces the importance of current (and obsolescent) stocks and increases the importance of productive facilities.

War Production Output

In a hot war of considerable duration the main determinant of the level of war production facilities is the share of total output devoted to war production. Although the share of the total is important at any point in time, over a long period the size of the total output becomes all-important. Short-run strategy in a cold war, therefore, should be aimed at reducing the share of output going to the cold war effort. Long-run policy should be aimed at reducing total levels of output.

The share available for any war effort is, in the long run (and in the short run, stocks excluded) limited by the surplus available (manpower basically, but also materials, plant, and equipment) after the basic needs of the population and the requirements for maintaining the economy intact have been met. Where agriculture occupies most of the population (as in the Soviet sphere), even a small change in its productivity can lead to a large percentage change in industrial employment, plant, and resources. Where industry employs many and agriculture employs few, only changes in industrial productivity itself have major effects on war output.

Production of consumers durable goods can be deferred for the duration of even a long hot war; the same is true of many semidurables (such as clothing, because of large stocks in the hands of ultimate consumers as well as of distributors); but not so in a protracted cold war, partly because the stocks would be used up, and partly for psychological reasons (one concept of cold war would equate consumers goods production with cold war potential). Therefore, decline in productivity in any sector of an economy will reduce its effectiveness for cold war purposes.

Some of those who claim that the cold war may be won and a hot one avoided by subversion of the Russian people to Western tastes, standards, and principles, would argue that the cold war objective of reducing productivity increase is mistaken. Once Russian standards are raised somewhat, and once the middle class of technicians and administrators is enlarged somewhat, it will be necessary to bribe them and appease them with consumers goods and freedom. But would the West be better off if the Soviet Government succeeds, through improving living standards and relaxing controls, in containing the discontent of its peoples, or would the West be better off if the Soviet Government fails? This is an extremely complicated question, which cannot be discussed within the limited scope of this article. We assume here that a Russia weak and discontented is the lesser menace.

Engineering Colleges

Engineering schools are not bombed in hot wars, not because the supply of engineers is not vital for the war effort, but because engineers are not very perishable, and only slowly become obsolescent. The annual output of engineers is only a small percentage of the total stock and, therefore, the destruction of engineering colleges together with their student bodies will have little effect on the course of even a long war. But in the longer vistas of a cold war the most urgent objective becomes the reduction of the productivity gains of the enemy economy; current output as such is of very little importance. Therefore, the reduction of the supply of engineers becomes a relevant objective, whether the ultimate aim of the cold war be reduction of war potential or limitation of rise in living standards.

The supply of engineers alone is a minor part of the picture, a part which has been greatly overemphasized. Productivity depends upon the skill and effort of the entire labor force and upon the quality of the tools and materials with which they work. Perhaps the most important component of productivity gains in the USSR in the past and in the foreseeable future is the shift of labor from a low-productivity sector (agriculture) to a high-productivity sector (industry). It should be our objective to reduce this shift as much as possible. The low-productivity sectors in the USSR, in addition to agriculture, are mainly the consumers goods industries, which, like agriculture, contribute directly to the standard of living.

In a cold war, as long as its duration is expected to be long but indefinite, diversion of manpower and resources to the

military forces, to the munitions industries, and to security functions, is, paradoxically, the best way of reducing potential, by minimizing gains in the standard of living and in productivity. Such diversion removes skilled manpower and needed resources away from operations in agriculture, basic raw materials, consumers goods, and even capital goods industries not engaged in defense production, funneling them to areas where they contribute nothing to the standard of living and little to productivity gains; it also reduces resources for investment in improvements in these nondefense industries and draws off highly skilled manpower from research and development in them.

Therefore, the country with the least security gains in the cold war, as long as a hot war is averted, and may gain even if a hot war does ensue, provided it is a long war. There is, however, a sharp conflict between the optimum conduct of a cold war and preparedness for a major war of short duration. If the losing contestant in a cold war retains the option of redressing the balance by a surprise attack, the objectives of the cold war cannot be pursued too vigorously or with undivided attention.

It may be argued that attempts to increase minimum tolerable standards of living, that is, by raising popular expectations, may further divert resources from productive investment to manufacture of consumers goods and provision of consumer services. This is a dangerous tactic, since substantial improvement in the standard of living may be accompanied or closely followed by dramatic improvements in labor productivity, which is held down in the Soviet sphere as much by psychological factors as by technical limitations. In some presently hard-pressed satellites it is probable that an increase in the supply of consumer goods would be the most efficacious way of raising productivity.

Conclusions

In a war expected to be short the enemy's war effort is not vulnerable through interdiction of its productive facilities. Offensive action should be directed toward destruction of military forces, equipment, and installations in being, toward preventing mobilization of existing reserves, including reserves of trained manpower, and toward destruction of military matériel stockpiles before they can be put to use. The lag of effects on military effort behind the interdiction must be short; duration of effects is unimportant.

In a war of intermediate expected duration the enemy is most vulnerable through attacks on plants turning out military end products and on supply lines from these to military forces. Stocks of end products may or may not be points of high vulnerability, depending upon whether or not production is keeping pace with consumption. Basic industries, because of long timelags of effects on the military effort, are at best of secondary importance, as are the supply lines from them to the users of their products. Both timelags and duration of interdiction effects on military effort must be considered.

In a long war the military effort is vulnerable at many more points than in a short war or in a war of intermediate expected duration. The timelag of effects is unimportant whereas the duration of effects, the recuperability of the enemy, becomes a crucial criterion of vulnerability. Stocks are rarely points of high vulnerability. Capacity of key basic industries in the metal-processing and engineering fields, fuel, and in transportation may become the limiting factors to war effort and, therefore, of prime importance as targets.

In a cold war, provided a hot war is not expected in the near future, the main objective is to reduce the enemy's productivity gains, rather than his production. This is best achieved by diverting the en-

emy's resources of skilled labor, materials, and equipment away from productivity-raising employments, for example, capital goods industries, and away from areas where productivity gains will be reflected in large increases in potential standard of living, that is, from agriculture. (This conclusion does not apply to Western nations in which only a small proportion of the labor force is engaged in agriculture and where dramatic improvements in its productivity cannot be expected in a short period.) In brief, the cold war objective should be to immobilize as many of the enemy's resources in military forces and munitions production as possible.

Nearly the total manpower and productive plant of a nation is "surplus" available for a military effort in a war expected to be very short. This surplus is of very limited military value since it is quite inflexible as to place and function. In a war of intermediate duration a smaller proportion of total resources is available, but it is more flexible in function. Excess capacity of plant, equipment, and labor force can be exploited and some conversion of all three to war production is feasible. Location of plants remains fixed but labor and other resources achieve some geographical flexibility.

In a long war an even smaller proportion of total resources is available for the war effort, but it can be adapted to almost any function, for a cost, and, within limits, it can be moved to almost any place. In a cold war resources available for increasing productivity are those not immobilized in military and security forces or in munitions production and not required to provide necessary services and supplies of consumer goods.

An important corollary follows from the nature of vulnerability. In the unlikely event of a major nuclear war expected to be of short duration (almost certainly the initial assumption of any future aggressor), most of our cities will be spared.

In the past we have tended perhaps to think of the Army-Industry partnership too exclusively in terms of industrial mobilization in wartime. It is undeniably true that our industrial capability is an integral part of our war potential. But it is also true that a prerequisite for exploitation of this potential has always been the shifting of gears from peacetime to wartime production—in other words, industrial mobilization.

Until recently this has been an acceptable state of affairs. In World War I and World War II, thanks to the time-distance factor provided by the Atlantic and Pacific Oceans and the state of development of transportation, and thanks also to the existence of allies to keep the enemy engaged, we had time to mobilize and train an army and to retool our industry for war production. However, this situation no longer exists. The danger is far more immediate. Due to advances in the field of military transportation, the time-distance factor has been telescoped. Instead of being held off from us by our allies, an enemy might well strike directly at the Continental United States itself. That being the case, the Army and the Nation must be able to react immediately and effectively. Thus more than ever before, the Industry-Army partnership must be an intimate, continuing reality, based on close cooperation which has its roots in a steady exchange of information, a two-way street of mutual assistance.

General Lyman L. Lemnitzer

NUCLEAR WEAPONS AND NATO

Colonel Bennett L. Jackson, *Infantry*
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ALTHOUGH it was not clearly set forth at the outset, and some of the member nations were not especially aware of it at the time, the North Atlantic Treaty Organization (NATO) has from its inception relied on a nuclear policy. Because the other member nations possessed no such capability, the earliest plans of NATO left the mission of strategic bombing to the United States, and this implied the use of the atom bomb.

The nuclear weapons and delivery capability of the Strategic Air Command have become the very core of NATO's deterrence policy. It follows, then, that NATO must have a resolute policy for the employment of nuclear weapons in a retaliatory role. Not so evident, however, is the policy which NATO should follow with respect to the employment of nuclear weapons in a tactical role.

If war is fought in Europe, it will take place in the NATO homeland and that of the satellite nations which the West would rather liberate than pulverize with nuclear warfare. Reliance on conventional weapons is an alternative which must be attractive to NATO although the feasibility of this policy is questionable.

"Forward Strategy"

NATO's policy with respect to tactical nuclear weapons is closely allied to its "forward strategy." The concept of "forward strategy," that is, defense as far to the east as possible, was agreed upon by the North Atlantic Council as early as September 1950. It was recognized that, in the beginning, forces were inadequate to give the strategy any real meaning. Forward delaying actions could be contemplated at best. Positions behind the Rhine offered the first real opportunity for a meaningful defense with the forces at hand.

Two events have given new meaning to the "forward strategy." One was the entry into NATO of the Federal German Republic with its expected contribution of forces. The other was the integration into NATO planning of tactical nuclear weapons. Speaking before the World Affairs Council of Los Angeles in November 1954, Field Marshal Montgomery made it clear that NATO planning embraced the use of nuclear weapons. A short time later, the North Atlantic Council gave its approval to this policy.

The Council's action did not provide a complete solution to the military problem of countering an enemy attack quickly. Planning for the use of tactical nuclear weapons was approved. The actual employment of the weapons was reserved, however, to the unanimity required for a Council decision. It is agreed that the decision to employ these weapons must remain a political one. It is necessary, however, to provide quick decisions in the matter in order to deal with a surprise attack. Mr. Spaak—now Secretary General—discussing this problem in the April 1955 issue of *Foreign Affairs*, noted the

The policy of defense of member nations adopted by NATO must be one of aggressive counteraction employing all the resources available to the organization to include weapons of the most decisive nature

progress made by NATO in military organization and suggested that a similar political integration within the framework of the Atlantic Pact was desirable as a means for dealing with such policy questions.

It would appear that the addition of tactical nuclear weapons to its arsenal has considerably strengthened NATO. This has not, however, been a comfort to many Europeans. In April 1957, eighteen West German scientists, under the leadership of Professor Weizsäcker, expressed their opposition to equipping the German Army with nuclear weapons. More recently, a Campaign for Nuclear Disarmament, under the guidance of Bertrand Russell, has been initiated in Britain.

The easing of tensions between the East and West inevitably is the concern of every thinking person today. It is not likely, however, that "banning the bomb" will provide any help in the matter. Nuclear weapons have never been the basis for these tensions. On the contrary, they have exerted a moderating influence. Foregoing the use of decisive weapons conceivably could make matters a great deal worse.

The fact is that, until the more troublesome problems have been solved within a wider framework, the defense of the NATO area is a military matter. The use or nonuse of nuclear weapons should, therefore, be determined upon the basis of military considerations.

Factors Involved

The principal factors which affect the military decision on the use of nuclear weapons in the NATO area appear to be the nature of strategy, that is, the defensive role assumed by NATO; the geography of the area and the time and space factors associated with it; the forces and weapons available to both sides; and the events of war which can be prognosticated both for the battlefield and for the area of strategic decision.

The defensive mission which NATO has set for itself is a psychological strength but a military weakness. The advantage is that NATO has defined its position clearly. The world can know from what quarter any aggression arises. This may be important in case of local aggression against member nations on NATO's periphery.

On the other hand, it was learned at Pearl Harbor that a high penalty can be exacted on a first strike. When the strike is a thermonuclear one, the penalty may be raised incalculably. Despite the disadvantages connected with the defensive role, however, an aggressive, preventive strategy for NATO must be ruled out. This is not based entirely on grounds of morality, although there is much in Western thinking that is opposed to aggression in any form. The fact is that NATO's political objectives could not best be served by an attack upon Russia. Also, it is not difficult to demonstrate that a preventive war would be unwise.

The acceptance of the role of defense does not mean that the enemy is privileged

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to carry the fighting into NATO's territory. This would be extremely critical for NATO, since the NATO land area in Europe has comparatively little depth and contains a concentrate of targets of strategic value. This argues that any attack must be countered as quickly as possible; it also argues for the use of decisive, that is, nuclear, weapons to accomplish this.

Geography

There are two ways of looking at NATO's geography. The pessimist sees it as a narrow European shelf from which SHAPE forces can be quickly driven into the sea; a wide Atlantic from which hostile submarines can interdict our line of communications; and the North American complex of bases and industry vulnerable to missiles and bombers across the polar regions. A more optimistic picture can be resolved if we look at the entire area.

Its boundaries—and bases—extend from Norway to Turkey; from northern Canada to southern Texas; from Fulda to San Francisco. This is not an unrealistic view in the nuclear age. However, to gain the strategic advantages offered by NATO's geography full use must be made of the forces of SAC, SHAPE, and SACLANT; the intermediate range ballistic missile must be deployed; and plans formulated for both strategic and tactical nuclear weapons.

The time and space factors dictated by the geography have an important bearing on the choice of weapons. Any imbalance of forces on the battlefield translates into a rate of advance for the stronger force. The distance from the Iron Curtain to the ports of France is so short that any rate of advance, no matter how small, will, if allowed to continue, ensure an early end to the initial phase of NATO's defense. The experiences of the last two wars are not applicable today. The trench stalemate of World War I and the "phony war" period of World War II, need not be repeated. Today, any nuclear combatant possesses the power to breach a line. He will use that power if need be, for he cannot afford to let a major war drag along indecisively when the next blow may prove to be the fatal one for him.

In World War II the British forces evacuated Dunkerque in May 1940. The Allied reentry into Europe did not take place until four years later. This leisurely pace of war cannot succeed in the nuclear age. If Central Europe is overrun, a wedge has been driven into the heart of SHAPE defenses; the two wings will undoubtedly collapse; and control of the Atlantic will be lost. One can conceive of the possibility that the allies, driven into Fortress America, eventually could command the resources and the ingenuity to regain a measure of initiative. However, these prospects are not very heartening.

Difficult Task

NATO's military commander has, therefore, been given a rather inflexible task. He must first of all defeat aggression quickly; most important, he must hold inviolate the vital areas of NATO. The flexibility enjoyed by World War II commanders, which enabled them to withdraw before superior forces in order to build up the strength required for a decisive blow, is not afforded SACEUR. Again, this argues for the prompt use of nuclear weapons.

If a conventional war strategy is infeasible for NATO, it is not because of the lack of resources. Captain Liddell Hart has reminded us that NATO has a population advantage over the Soviet bloc. A 1955 report of the Joint Congressional Committee on the Economic Report arrived at the conclusion that:

The present economic capacity of Western Europe, the United States, and Canada is significantly greater in terms of absolute magnitude, diversity, and flexibility than the combined strength of the Soviet bloc.

This conclusion was based on a comprehensive, comparative study of manpower, agriculture, steel capacity, transportation, and power potentials.

It has been our recent military experience that it was economic strength which won for a nation its wars. Both World Wars I and II were victories for the United States because of her economic base. In both, there existed time for the industrial base to pour out the weapons needed; to train the forces required; indeed, time to plan and coordinate their use to the best advantage. Tomorrow's aggressor will possess, at the outset, sufficient power to overrun any but an alert, determined, and well-prepared adversary. Because war employing major forces need not be prolonged, it probably will not be. The mobilization base can make a contribution to any major war only if it is covered by reasonable forces in being, forces possessing the nuclear firepower necessary to halt and hold any attack.

Reduced Forces

The adoption of tactical nuclear weapons by NATO, while it made the "forward strategy" reasonable, was not without its unfortunate aspects. The pressures on political leaders for the reduction of defense spending are omnipresent. Nuclear tactics provided another argument which could be turned against stated force requirements. "If nuclear firepower can do the job, then manpower requirements are reduced," goes the rationalization. *When a clearer visualization of the battlefield emerges, it may be found that more, not fewer, men will be required.* If the latter is true, then the military should hasten to demonstrate it, for it is not the popular conception today.

There are some critics of NATO's nuclear policy who see it as a parsimonious policy arrived at only through reluctance to provide the forces necessary to repel an attack by conventional means. Even if this were true, it would only mean that NATO had arrived at the right policy for the wrong reasons. The Soviets have made a public display of their considerable arsenal of tactical nuclear weapons. Since the Soviets have the capability of creating a nuclear battlefield, NATO forces must be given the means of living on that battlefield and carrying out their mission.

Dual Purpose

It should be remembered that, given the nuclear capability of the Soviets, the West is denied the opportunity of preparing only for conventional war. NATO can, if it chooses, develop forces to fight conventional war; in any case, however, its forces must have a nuclear capability. There are possibilities in the development of dual-purpose forces, but there also are inevitable duplications which are both awkward and expensive when applied to forces on the scale required for a major war.

The biggest difficulty comes in the battlefield employment of the NATO forces. It can be said with certainty that the next battlefield involving major forces of a nuclear power will be a nuclear battlefield. Even if neither side fires a nuclear round, commanders must employ their troops as though the next round, theirs or the enemy's, was going to be nuclear. Thus NATO forces must not only develop their nuclear capability, they must have the impedimenta for nuclear warfare constantly by their side; and their dispositions must be appropriate to the nuclear battlefield.

Since the defensive positions appropriate to the nuclear battlefield are not calculated to halt the mass of conventional attack quickly—except by the use of the associated weapon—such defense would be far too soft for the NATO area which has no great depth. Thus it is questionable, from a military point of view, that NATO

forces can be employed prudently in a conventional role as a counter to the Soviet threat.

Past Methods Outmoded

It is a troublesome thing, but the military must accept the fact that means and methods of war that were once successful can be outmoded very quickly. What has happened so often in the past may have occurred again. It may well be that never again can a general war be fought out in the manner of World War II.

One difficulty in visualizing conventional war today lies not so much in the employment of forces on the battlefield, but rather in the employment of strategic weapons. For example, given the improved capabilities of today's air defense missiles, would it be feasible to undertake conventional bombing of the industrial base? Could even the lines of communication be interdicted effectively by conventional means? If the industrial base and the lines of communications are not attrited, would not such a war tend to drag out inconclusively?

The give and take of a long conventional war might be more costly than would one brought to a quick decision by the use of nuclear weapons. In any case, the war begun conventionally could always end with nuclear strikes. The more war weary and exhausted the opponents, the more likely is one of them to resort to weapons of quick decision.

It may be that the accuracy and production of missiles can be developed to the point where, with high explosive warheads, they can do the job of World War II bombers, although this is far from being economically practicable today. In any case, it is probably unrealistic to suppose that conventional warfare can be projected in this manner. If the missiles are really effective, they constitute an open invitation to nuclear reprisals. To have conventional war today is to have a form of limited war. This means that each of the adversaries must remain satisfied with the restraints practiced by the other. If one of them equates damage by conventional warheads to that of nuclear strikes, the restraint as to weapons loses its meaning.

Conventional War

A grave disadvantage would be that NATO could not really choose conventional war at all. It may have the opportunity of initiating nuclear warfare, but only the enemy, in initiating the attack, could choose conventional weapons. Even should the enemy choose to enter the war with conventional weapons, there could never be any certainty that he would not go to nuclear weapons when it was advantageous to do so. For example, if the NATO forces concentrated to defend against a mass, conventional attack, they would be extremely vulnerable to a nuclear strike. Indeed, the advantage of ruse, deception, and surprise which would be enjoyed by a force holding the power of forcing such an alternative could well be decisive.

There are places in the world today where limited war appears to be feasible. For such wars the employment of conventional means may be the best policy. Indeed, there seems to be a certain compatibility between limited war and conventional weapons, just as there is between general war and nuclear weapons. Unfortunately, it appears that the NATO area is not one where limited war can be conducted prudently. It follows that it also would be imprudent to rely on conventional forces for the conduct of NATO's defense.

In a November 1955 letter to President Eisenhower, Premier Bulganin boasted that Soviet forces could conquer Europe without the use of nuclear weapons. If we are to believe him, then NATO's nuclear policy is indispensible to Europe's safety.

Conclusion

NATO already has accepted the handicap of a defensive mission and an imbalance of forces; it cannot afford to assume as well the handicap of giving the enemy the initiative with respect to the decisive weapons.

In addressing the 1957 Annual Meeting of the Association of the United States Army, General Norstad made it plain that he considered deterrence to be NATO's first duty. In his view it is the integration of the "shield" and retaliatory forces that gives maximum effect to NATO's deterrence.

It appears that NATO's nuclear policy has two advantages. First, and most important, it adds immeasurably to the deterrent value of NATO's forces. Second, it provides the most feasible response to any Soviet aggression.

I think we can all agree that in this period of dangerous living the United States must carry some kind of stick in international society. The question is 'What kind or kinds of stick?' The stick with which we are most often seen in public is the big atomic weapon of great destruction represented by our strategic airpower. . . .

My conclusion is that indeed this one big stick is not enough. We must have others of descending size which do less but which are applicable to more situations. Such lesser sticks are represented by the mobile, flexible forces such as those maintained by the Army and other services, which have a capability for producing both atomic and conventional effects with their weapons without resort to massive destruction.

Such forces must be armed and trained for many uses, ranging from the smallest police type actions and extending to general war itself. Their use should be based upon flexible plans designed to anticipate many possible forms of challenge. They require the most modern weapons so that by the quality of their equipment they can compensate for any shortfall in numbers when faced with the masses of the potential enemy. Their weapons must have a wide range of application and effectiveness. They must be prepared to use nuclear weapons if need be but, at the same time, be prepared to keep the peace by the use of so-called conventional weapons.

General Maxwell D. Taylor

UNITED STATES ARMY AIR DEFENSE SCHOOL

Material for this article was furnished by the United States Army Air Defense School, Fort Bliss, Texas. —Editor.

THE U. S. Army Air Defense School at Fort Bliss is today a focal point of surface-to-air missile power in the Western World; distinguished visitors from many nations place it high on the list of what they wish to see in the United States. Those in recent months have included Cabinet members of several European governments, high-ranking diplomats, and chiefs of armed forces.

Their interest centers around the world-famous *Nike* missile system, and the new low-altitude defender, *Hawk*. In addition, they observe the methods of instruction that have turned out thousands of trained officers, technicians, and specialists who are now manning and maintaining the Army air defenses of the Continental United States and our Armed Forces overseas.

During recent years the school has experienced a remarkable period of growth, and there has been increasing recognition of its vital significance in the structure of our national defense.

Conducting classes for more than 6,000 students involves the use of equipment valued in excess of 160 million dollars—equipment which never gets cold because it is in operation 18 hours a day and undergoing maintenance during the remaining six hours. In 1958 the school's physical plant was valued at $15,159,317 and included 327 buildings. On 31 October 1958 the total number of graduates from the school since 1942 had reached a figure of more than 135,000.

History

Although the U. S. Army Air Defense School has been located at Fort Bliss for only 14 years, its lineage is traced through the old Coast Artillery School, directly to the Artillery Corps for Instruction, founded at Fortress Monroe, Virginia, on 5 April 1824, pursuant to General Order Number 18, The Adjutant General's Office, Washington, D. C.

At the end of World War I, and in accordance with the assignment of the responsibility for Army air defense to the Coast Artillery Corps, antiaircraft artillery (AAA) subjects began to take up a large part of the curriculum at the Coast Artillery School. By March 1942 the AAA training and activities had far outgrown the facilities at Fort Monroe, and it became evident that this training would have to be separated from the Coast Artillery function in order to meet the demand for expansion of antiaircraft artillery created by World War II.

The result of this inevitable pressure was the establishment of the Antiaircraft Artillery School at Camp Davis, North Carolina, coincident with the activation of the new Antiaircraft Command under Army Ground Forces. The Officer Candidate Division was first to move to Camp Davis, followed by the Officers' and Enlisted Specialist Divisions.

In September 1944 the school moved to Fort Bliss, Texas. When the war ended a year later, more than 70,000 individuals had been graduated from courses conducted at Camp Davis and Fort Bliss dur-

The United States Army Air Defense School at Fort Bliss plays a vitally significant role in the structure of our national defense, and is a focal point of surface-to-air missile power in the Western World

ing the period March 1942 to September 1945.

On 1 November 1946 the Antiaircraft Artillery School became the Antiaircraft and Guided Missiles Branch, The Artillery School. On 13 April 1955 the branch was made a separate school, and on 1 July 1957 it was redesignated the United States Army Air Defense School.

Mission

The mission of the U. S. Army Air Defense School is to prepare selected individuals of the Artillery, and such other branches of the Army and components of the Armed Forces as may be necessary, to perform those duties they may be called upon to accomplish in war. Additional missions charged to the school are as follows:

1. Within the concept guidance furnished by Headquarters, U. S. Continental Army Command, develop doctrine, organization, procedures, and tactics and techniques relating to Army participation in units up to and including the regimental combat team, combat command, and brigade level, the active air defense of joint and unilateral operations, airborne and amphibious operations, and operations involving logistic support by Army transport aviation.

2. Within this same concept guidance from USCONARC, develop doctrine, organizations, procedures, and tactics and techniques relating to the air defense employment of artillery gun, surface-to-air missile, and electronic warfare units up to and including the brigade level in the joint and unilateral operations, airborne and amphibious operations, and operations involving logistic support by Army transport aviation.

The U. S. Army Air Defense School is responsible for:

1. Reviewing, evaluating, and coordinating doctrine, procedures, tactics, and techniques developed by the other services and other Army agencies, as directed by Headquarters USCONARC.

2. Observing training as directed by Headquarters USCONARC, and, based upon the report of such observations, evaluating and making recommendations thereon.

3. Recommending requirements for new matériel or product improvements of existing matériel to be used by Army air defense units.

4. Preparing Department of the Army air defense artillery and guided missile training literature, training aids, and nuclear weapons training literature as directed by Headquarters USCONARC.

5. Accomplishing Army-wide and interservice understanding of air defense artillery and guided missile tactics, techniques, and operations by providing training for limited numbers of members of other branches of the Army and other components of the Armed Forces.

6. Providing support for such other training activities of the Army as may be directed by Headquarters USCONARC.

Reorganization

In September 1958 the commandant approved final plans for the reorganization of the school's staff and academic structure (see chart).

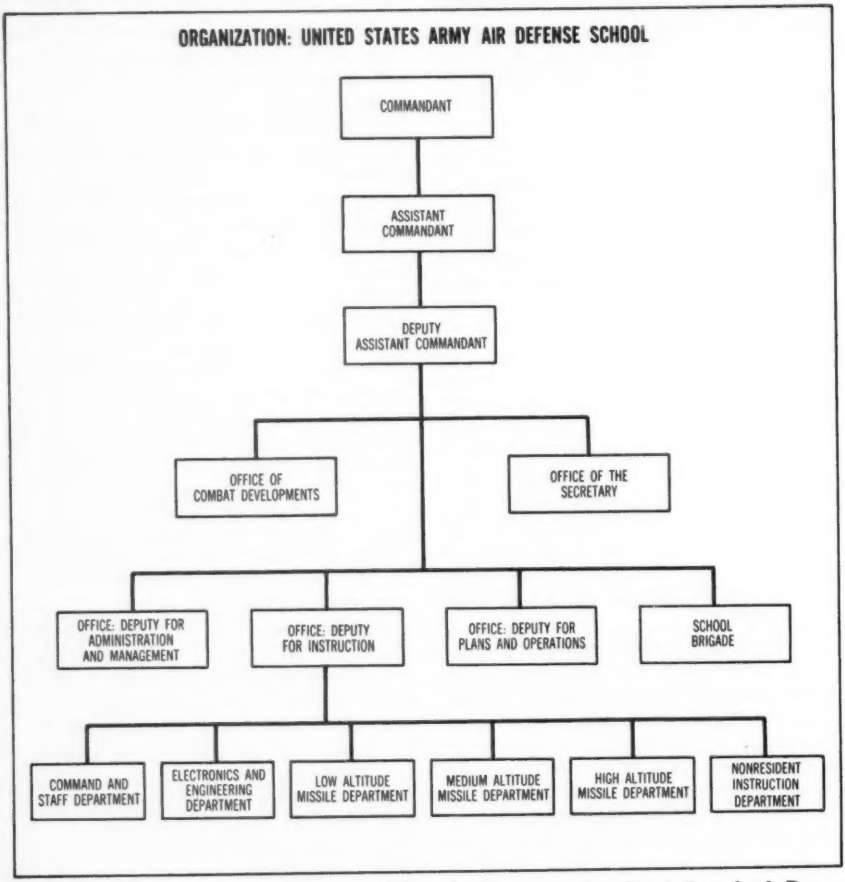
The new organization provides for more efficient training of the 6,000 students now in residence and the steady input expected in the future. Administrative and operational functions of the school also have been coordinated and streamlined.

Outstanding changes in the organizational structure include the creation of two new deputies, redesignation of the Gunnery and Matériel Department as the Low Altitude Missile Department, and the creation of two new missile departments from the overexpanded Guided Missiles Department.

The High Altitude Missile Department conducts resident instruction on the *Nike Hercules* system, while the instruction on *Nike Ajax* is handled by the Medium Altitude Missile Department. The Low Al-

titude Missile Department teaches technical aspects, maintenance, operation, and adjustment of the *Hawk* missile system, the 40-mm *M42*, 75-mm *Skysweeper*, 90-mm AAA guns, and associated fire control systems.

Elements of the School Brigade include three regiments—officer students, enlisted students, enlisted staff and faculty—and a separate allied student battalion. The brigade performs all the usual functions of administrative support to the school.



Courses of Instruction

Instruction in guided missiles was started early in 1946. It now comprises the great bulk of the subject matter in the 52 courses taught at the school. Ranging in length from one to 68 weeks, these courses provide branch and specialized training in the duties and responsibilities of air defense officers, and training in the technical operation and maintenance of air defense weapons for enlisted personnel.

The school's most advanced and thorough

course of instruction on guided missiles is the Guided Missile Staff Officer Course.

Officers selected for the course spend nine months in residence pursuing studies in propulsion, guidance, aerodynamics, advanced electronics, and nuclear physics. Prerequisites for the course include completion of college-level courses in differential and integral calculus and one semester of college-level engineering physics.

Field trips during the course acquaint students with research and development and manufacturing techniques in the guided missile field. Upon graduation, these officers are ready for a wide variety of assignments in the guided missile program of the Department of the Army.

The school also conducts a course of major interest to all branches of the Army and to other services: the Atomic Weapons—Guided Missile Orientation Course. During the six years since this course was first established, a long list of civilian and military leaders have attended.

Starting on Mondays, the course lasts for five and one-half days. Normally, there are 44 classes conducted each year.

The Nonresident Instruction Department reaches more than 59,000 individuals annually with its diversified program. It conducts extension courses, instruction at branch installations, and publishes training material to support nonresident instruction. This is an Army-wide program affecting all air defense units of the Active Army, the Army Reserve, and the Army National Guard within the Continental United States and overseas.

The NATO Program

The school participates in a program involving the training of personnel from countries of the North Atlantic Treaty Organization in the maintenance and employment of the *Nike Hercules* system.

The purpose of this program is to provide a number of *Nike Hercules* battalions in the NATO defense structure, completely operated and maintained by military forces of the member nations.

The same package training concept utilized for the training of US *Nike* units is employed in the training of NATO personnel. The training is the joint responsibility of the U. S. Army Air Defense School and the 1st Guided Missile Brigade. The school conducts five courses of instruction, four of them producing technicians—both enlisted and officer—who are highly skilled in the maintenance of the *Nike Hercules* system. The fifth course trains key officer personnel who are responsible for the employment and supervision of maintenance of the system.

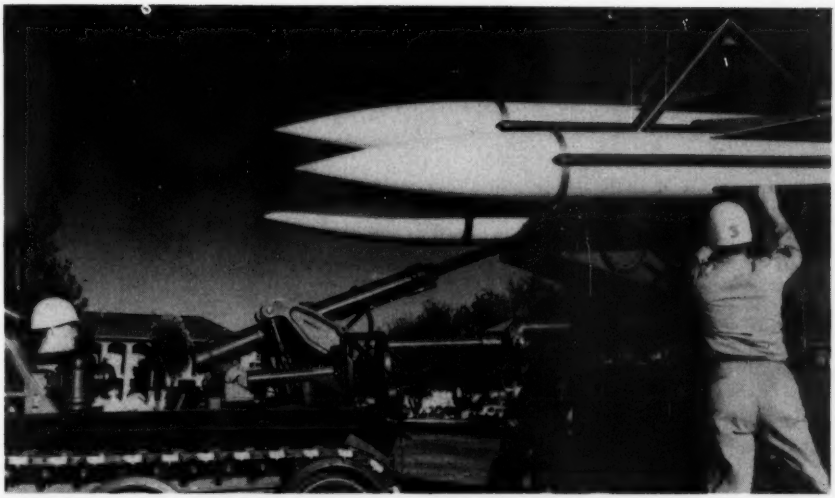
Although these courses vary in length from 17 up to 68 weeks, the starting dates are so phased that all courses for a given package will graduate simultaneously. Meanwhile, the 1st Guided Missile Brigade completes the training of operator type personnel, the training cycle being timed to coincide with the graduation of school-trained technicians.

The two elements are then combined and undergo a period of unit training with the *Nike Hercules* equipment which includes actual firing of the missiles. After this unit training is completed, the personnel return to their home country where, with the augmentation of nontechnical personnel, an operational *Nike Hercules* battalion is formed.

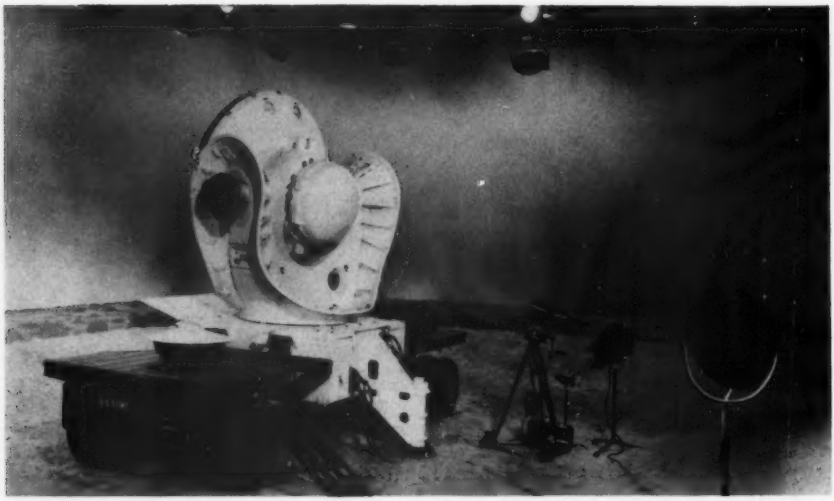
In addition to the program of training being offered to representatives of nine NATO countries, classes are conducted for other allied students from all parts of the world. At the present time there are more than 500 of these students in residence from 24 countries, providing the school with a sizable "international community."

An indication of the activities of the school is contained in the following official United States Army photographs.

Above, is Hinman Hall, principal administrative and classroom building of the U. S. Army Air Defense School, Fort Bliss, Texas. Below, *Nike Ajax* missiles being televised during production of the "Wide Wide World" program at Fort Bliss on 19 January 1958.



Above, a trio of *Hawk* missiles—the Army's newest killer of low-flying aircraft—being transferred from the loader to the launcher by a crew from the Low Altitude Missile Department of the school. Below, a visiting group receives a briefing on the *Nike* missile system at the United States Army Air Defense School, Fort Bliss, Texas.



Above, the stage is set for the production of a training film dealing with *Nike Hercules* ground guidance equipment at Fort Bliss. Below, Colonel J. M. D. Symons, Commandant of the Royal Canadian School of Artillery, checks over a *Nike Hercules* during a visit to the U. S. Army Air Defense School. The school participates in a program involving the training of personnel from countries of the North Atlantic Treaty Organization.

Above, three Japanese Army division commanders look over the control panel of a *Nike* battery during a visit to the school. Below left, Danish soldiers and a member of the enlisted faculty leave Hinman Hall after an orientation lecture. Below right, an enlisted instructor in the Electronics and Engineering Department of the U. S. Army Air Defense School, points out the adjustment of a control unit for acquisition radar equipment.

Close Air Support in the Nuclear Age

Major Robert G. Brotherton, *United States Air Force*
Headquarters United States Air Force

AN ARTIST would say that proper perspective is absolutely essential to the painter who seeks to understand the intricacies of landscape art. So it is with things military; particularly in areas where joint operations are essential to success on the nuclear battlefield.

Experiences in World War II and in Korea clearly revealed the necessity for close air support operations to be conducted jointly by the Army and the Air Force. Early in the North African Campaign the Allied forces learned that air forces must operate independently in cooperation with ground forces. Field Marshal Montgomery speaking of this campaign said:

Nothing could be more fatal to successful results than to dissipate the air resources into small packets placed under the command of army formation commanders, with each packet working on its own plan.[1]

General Eisenhower wrote of the same campaign:

The new administrative and operational organization successfully solved one of the basic problems of modern warfare—how to apply airpower most effectively to the support of land operations. Direct support of ground troops is naturally the method preferred by the immediate military commander concerned, but this needs to be supplemented by assaults on the enemy's bases, on his lines of communication, and on his factories, which are beyond the immediate range of the local commander's vision.[2]

The Korean war reemphasized the need for a closely coordinated joint system of close air support. The Air Force organization that executes the mission of close air support is the Tactical Air Force (TAF).

Tasks of Tactical Air Forces

Tactical Air Forces perform three main tasks: counterair operations, interdiction, and close air support. The order in which these tasks are given does not always indicate the priority. Often, all three tasks are performed simultaneously or emphasis may shift from one to the other depending upon the enemy's capabilities. Gaining control of the air, for example, is a relative matter. An enemy with an inferior air force may hoard his airpower in order to challenge control of the air over a given area for a period of time. In cases where the enemy is moving large reinforcements toward the combat zone, it may be necessary to shift emphasis to interdiction. In any event, the enemy threat from the air must be stopped by timely concentration of forces available to the tactical air commander.

In a general nuclear war the Air Force will be concerned initially in neutralizing the enemy's retaliatory capability and in achieving air superiority. Once this is ac-

[1] *General Training* (Tactical Air Command, USAF, Volume III, FY 1957), p. 8.

[2] *Ibid.*, p. 63.

Procedures for joint air-ground operations set forth in JAGOM have overcome many past problems of the old system, and if proved satisfactory after testing should result in a joint departmental directive

complished the provision of close air support to the Army in the fulfillment of its mission will play an important part.

For a considerable period, however, there will be a "gray" area between the phases of war during which the enemy—by carefully using his remaining nuclear weapons, aircraft, and remaining productive means—will be able to mount offensive air strikes against our forces with devastating effect unless our air forces are sufficiently flexible to counter them. When it is considered that the fallout pattern from the surface burst of a hydrogen weapon dropped by an enemy plane could contaminate more than one-third of a field army area, the tremendous threat of enemy airpower is brought into sharp focus. It is necessary, therefore, to destroy as many of the enemy's aircraft as possible on the ground before they can devastate our area.

Enemy airfields and missile launching sites also must be destroyed and it must be made difficult for him to rebuild his airfields or reconstitute his air force. Because of the speed, range, mobility, and flexibility of modern enemy aircraft, local air superiority will be much more difficult to achieve in the future. Hence it is likely that counterair operations will have more significance than ever before. It is, therefore, vital that the air commander retain flexibility in the use of his air weapons systems in order to achieve maximum destruction of the enemy's airpower.

Army commanders are, of course, vitally interested in the progress and success of the counterair and interdiction operations of the Tactical Air Force. However, their interest is centered in over-all planning aspects and not in command control of these types of operations. Army commanders, on the other hand, are particularly concerned about the close support mission. It is in this area that their day-to-day operations are most immediately affected. Integration of fire support means is of vital concern to them. Furthermore, it is traditional in the Army that the supported force commander receive maximum assistance from the supporting force commander.

FIGURE 1.

The army commander desires a firm allocation of air effort far enough in advance of an operation to permit incorporation of this effort in his over-all plan of operations. The army commander, faced with the problem of obtaining maximum support for his ground forces in the contact area, is not always cognizant of the reasons for the Air Force to withdraw aircraft occasionally from his mission to fight the counterair battle. It is understandable why divergencies in doctrinal

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concepts and methods of operation crop up to plague successful resolution of disagreements. What has been done, and what is being done, to solve this problem?

The JOC Concept

On 1 September 1950 the Office, Chief Army Field Forces, and Headquarters, Tactical Air Command, published a *Joint Training Directive for Air-Ground Operations*. This document, according to the introduction to the text, was to provide a working doctrine for units of the field army and of the tactical air force. Its provisions were to be incorporated in a joint departmental level publication after adequate field testing. Actually, it was the outbreak of the Korean war that made essential the amplification of previous manuals and concepts.

The Joint Training Directive established the Joint Operations Center (JOC) as the nerve center of close air support operations. According to the doctrine it was here that the field army commander and tactical air force commander met on a coequal basis. The Army submitted requests for air support on a day-to-day basis which were firmed up at an evening planning conference attended by the respective commanders or their representatives. The air missions usually were planned in detail for the following 24-hour period.

On the Air Force side, the JOC was associated with the Air Control Center (ACC). The ACC was the nerve center that linked the Forward Air Controllers (FAC's) at regimental level, and Air Liaison Officers (ALO's) at division and corps level, to the airfield complex and the tactical air control system. On the Army side the JOC was tied into the corps and divisions by air request and air information nets. In addition, the Army had Ground Liaison Officers (GLO's) at Air Force reconnaissance and fighter-bomber airfields together with a GLO net linking them to the JOC. A spot report receiver system was provided so that pilot reports could be monitored by divisions and corps.

The Air Liaison Officers functioned as Air Force advisors at division and corps and coordinated activities of the Forward Air Controllers at lower echelons. When air alert aircraft were made available at a certain echelon, they were under the operational control of the ALO at that echelon.

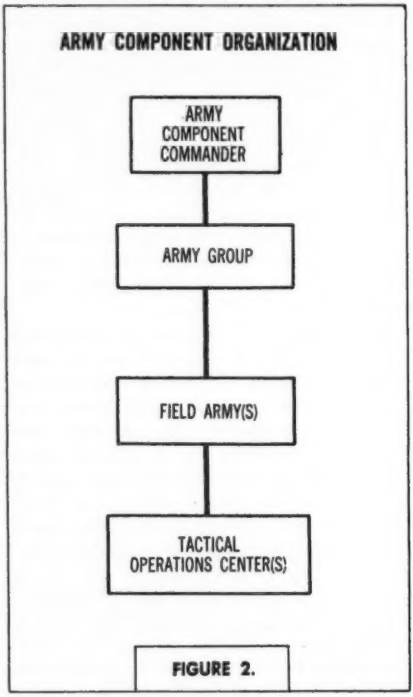

FIGURE 2.

Objections to JOC

The Army objections to the JOC concept were basically in two areas. The Army felt that the supporting force commander should "come to" the supported force commander. Since the JOC moved with the Air Control Center, representatives of the field army commander at times might have to operate at considerable dis-

tance from army headquarters, with possibilities of delays, confusion, and misunderstanding.

The other major objection of the Army concerned allocation of air missions. The Army felt that more advanced notification was required to integrate air effort into operational plans. The Army desired two or three days' notification on aircraft availability and assurance that the missions would be executed. The Army also felt the tactical air commander exercised too much discretionary authority over "approving" missions.

The Air Force faced the dilemma of attempting to separate close air support operations from counterair and interdiction operations without jeopardizing the flexibility of being able to perform any or all of these missions as the need arose.

New Concept

Considerable study was given to the deficiencies of the JOC concept by both the Air Force and the Army in order to evolve a mutually acceptable doctrine for joint air-ground operations. Rapid strides in aircraft and radar capabilities during the last few years were incorporated into the modernization process.

Results of this study were published on 1 September 1957, in the form of a new doctrinal concept entitled *Joint Air-Ground Operations*, prepared jointly by Headquarters, Tactical Air Command and Headquarters, United States Continental Army Command. The introduction states, as did the old Joint Training Directive, an intent to incorporate, eventually, its provisions into a joint departmental level publication. An examination of the publication reveals several changes that have been effected.

The Air Force, first of all, reevaluated the size area that a tactical air force commander could cover with the modern radar and high performance aircraft at his disposal. The study revealed that he could adequately cover an area about 500 miles deep by 300 miles wide. This area also meets the requirement for greater dispersion. Increased span of control was made possible by "TAC-BADGE"—a highly mobile communications system based on automatic data processing and transmission.

The nerve center of this system is the Air Operations Center (AOC) where TAF combat operations plans are implemented. Status boards visually and continuously reflect aircraft status, conditions of alert, weather, ordnance, and base-in and base-out status. Even closed circuit color television is incorporated to provide instant contact with army group headquarters through which the ground situation and grids necessary to formulate decisions are displayed automatically.

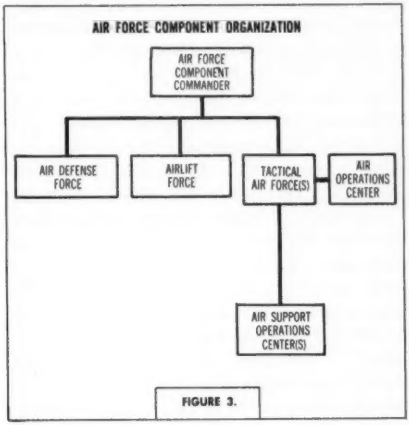

FIGURE 3.

As a result of these new advances, the tactical air force has moved up a level from the old JOC structure and now deals with the army group commander on matters of aircraft allocation and interstaff planning. Another advantage of this system is that in case the TAF commander and the army group commander cannot agree, differences can be resolved quickly by the theater commander.

Generally speaking, TAF and army group boundaries will coincide. However,

boundaries below this level probably will not coincide since TAF forward area boundaries will depend essentially on coverage by the radar system, whereas field army boundaries will depend on terrain features. Although the Army is inclined to object to this arrangement—feeling that coordination is rendered more difficult—the problem is partially resolved in the following manner.

At field army level there is an Air Support Operations Center (ASOC) an Air Force agency associated with each field army. It is the sole task of the ASOC Director, who is an Air Force brigadier general, to support the field army. The ASOC provides final control and coordination of air effort allocated to support the field army. At each field army there is a Tactical Operations Center (TOC), or comparable agency designed to coordinate all tactical support means available to the field army commander. The ASOC is located adjacent to the army TOC and maintains very close relations with it. The ASOC is highly mobile and moves each time the field army moves. Thus one of the key criticisms of the old system is overcome. The ASOC goes with the TOC instead of army personnel moving with the JOC. Preplanned requirements for air support result from detailed joint coordination between the TOC and ASOC. These requirements are then forwarded to army group.

Army group consolidates field army requirements, assigns priorities to them, and presents the army requirements to the AOC Director. The AOC Director allocates available air effort for the major tasks of counterair, interdiction, and close air support. He bases this assignment on the enemy air situation, order of battle, and the ground situation. The aircraft are allocated for close air support missions on the basis of number of sorties per day. Based on priorities established by army group, ASOC's and TOC's are advised of the number of allocated sorties per day. It is, therefore, unimportant whether air or field army boundaries coincide. The field army is allocated its sorties per day through its associated ASOC.

Under this system it is possible to allocate aircraft for a period of time in excess of the old system. Thus Fire Support Plans can be better integrated.

More Flexible

The system is more flexible in many respects. First of all, the field army commander has an air mission allocation he can reasonably count on. However, reallocation can be made in emergencies by the AOC Director from ASOC's associated with other field armies if the army group commander so desires, or the AOC Director can also reallocate sorties from counterair or interdiction missions if the situation permits. Thus the field army commander may obtain more sorties than he was originally scheduled to receive.

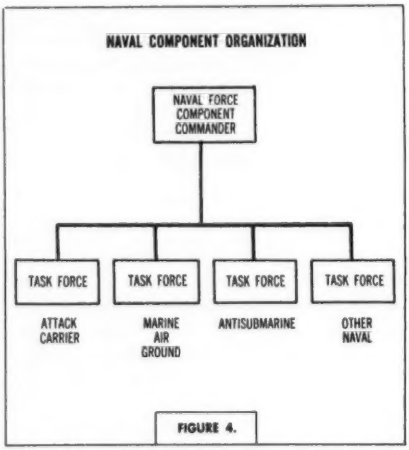

FIGURE 4.

Conversely, the TAF commander retains his essential flexibility in that in emergencies he can withdraw allocations from the ASOC's in consultation with the army group commander to perform essential counterair or interdiction missions.

Under the new system the ASOC and TOC Directors plan the requirements for sorties together. Once the sorties have been allocated, it is the sole mission of the ASOC Director to support the field army. He still retains a degree of discretionary authority, but this concerns only such matters as involve safety of flight, capability to perform the mission due to aircraft or crew limitations, and weather. This kind of authority is only reasonable and is not much more discretionary than a division artillery commander possesses over artillery support missions.

There are several other changes in the system of air-ground operations which make it a far more efficient and functional system than the old JOC concept. Among these changes are close communications links between army air defense facilities and the TAF radar net through the Sector Control Centers (SCC's). The new radar systems also make possible more accurate radar bombing at distances closer to the forward edge of battle area (FEBA). The *MSQ-1A*, utilizing a single ground based radar and computer, can direct an aircraft to automatic release with accuracies of 200 to 300 feet at ranges up to about 50 miles from the radar. The digital computers make the system so flexible that aircraft availability is known from minute to minute on a continuous basis. Thus maximum utilization of aircraft is possible at all times.

Although all of the numerous aspects of the new system have not been fully analyzed, the areas of possible interservice divergencies have been covered in sufficient detail to point out the manner in which the services hope to overcome them.

Conclusion

Many officers in the Army and the Air Force feel that a joint departmental level directive on air-ground operations should have been published by this time. The problems are complex, and as the artist would advise, a keen sense of perception is essential to raise the level of air-ground operations to a fine art.

Those who insist upon spelling out every possible exigency in the form of positive statements or directives before authorizing a departmental directive are doomed to disappointment. The inherent flexibility in the system, essential if it is to function smoothly and efficiently, precludes excessive formalization. Instead, good judgment, a positive approach, and mutual understanding must provide the key to success of the system. Good judgment, tact, and a cooperative spirit can never be legislated.

In the meantime the system must be given a fair test by openminded individuals. As the introduction to the new system states, "The objective of this directive is to establish jointly acceptable operational procedures through mutual compromise, where necessary, of divergent doctrinal positions." A really fair test of the new concept will not be possible until later this year because not until then will the new radars and computers be integrated into the system. In the meantime administrative procedures can be developed and modified as necessary.

Once the new system has been thoroughly tested and found suitable in all key aspects, joint departmental directives incorporating it should be published without delay. Like the American Constitution, the directives should be broad enough to facilitate flexibility and permit a *modus operandi* to suit all types of combat conditions. Failure to publish a joint departmental directive produces a negative effect and only serves to build in the minds of those who work with the system the feeling that divergencies cannot be resolved.

A New Concept for Military Organization

Colonel Seymour I. Gilman, *General Staff*
Headquarters, United States Army Air Defense Command

SPUTNIK triggered the submission to Congress of the Department of Defense Reorganization Act of 1958. It provided the necessary degree of urgency and impetus to enable its passage essentially as submitted. This action was long overdue and would have been brought about inevitably by the revolution in weapons technology which has made traditional land, sea, and air concepts of warfare obsolete.

Now that the act is being put into practice, it is appropriate to see how far this new organization goes toward resolving the fundamental problems and how it measures up to the challenge of the nuclear missile age.

The principal objective of the Department of Defense Reorganization Act of 1958 and related Presidential directives was to provide the Secretary of Defense with more effective command and control of the operational military forces. The act affects primarily the authority of the Secretary of Defense and the organization and functions of the Joint Chiefs of Staff (JCS). It does not affect materially the organization and basic functions of the separate services.

The principal provisions of the act are:

1. The strengthening of the direction, authority, and control of the Secretary of Defense over the services.

2. The assignment to JCS of the responsibility for unified strategic planning, strategic direction of the operational forces, and for the conduct of combat operations by unified and specified commands.

3. The establishment of "truly" Unified Commands responsible directly to the Secretary of Defense, and the discontinuance of the use of the services as executive agencies.

The act also includes various other provisions designed to streamline military command channels and the operations of the Secretary of Defense and of the JCS.

Shortcomings

The new organization, however, involves no change in the basic functions of the four services. The Army will continue to be responsible for land warfare, the Navy for sea operations, the Air Force for aerial warfare, and the Marine Corps for amphibious operations.

The President, in his message to Congress on 3 April 1958, said:

Separate ground, sea, and air warfare is gone forever. If ever again we should be involved in war, we will fight it in all elements, with all services, as one single concentrated effort.

The primary objective of the reorganization was to enable us to fight in this manner. The provisions of the Reorganization Act correct the most immediate and pressing problems, constitute a bold positive step in this direction, and provide an excellent framework for further improvements. However, they do not go far enough toward resolving the fundamental problems which stem from the assigned roles and missions and the land, sea, and air

A complete military reorganization designed on a functional basis providing increased economy, flexibility of operation, and military effectiveness is needed to meet the challenge of the nuclear missile age

division of service responsibilities. If separate ground, sea, and air warfare is gone forever, then is there any reason for retaining intact as now constituted those services whose respective missions are to provide units capable of fighting separately on land, on the sea, and in the air?

The present concept prescribes vague boundaries between service roles and missions. For example, in the field of air defense the Army is responsible for point or local defense, the Air Force for area defense. This distinction is becoming more and more obscure as improved longer range missiles become available to both services. Surface-to-surface missiles are assigned to various services according to their maximum range capabilities. There are many other similar limitations and restrictions contained in various defense memoranda. These are all unrealistic, inconsistent with the characteristics and capabilities of the weapons of the nuclear missile age, and inhibit technological progress. These new weapons have virtually unlimited range, flexibility, and performance without regard to their launching and target environment; whether it be ground, sea, or air. Their performance and application are limited only by their design.

The Army operating strictly within its assigned role now finds itself in direct competition with the Air Force in several fields. The Army surface-to-air missile has not only rendered the antiaircraft gun obsolete, but also challenges the future of the interceptor. In fact, the missile appears to be a more desirable air defense weapon on a cost-effectiveness basis. Likewise the surface-to-surface missile has not only replaced certain types of artillery, but now is in competition with tactical aircraft as a means of delivery of nuclear warheads. In addition, with the allocation of nuclear warheads for use in Army missiles, the difference between strategic and tactical weapons is obscured.

General of the Army Omar N. Bradley testified on the reorganization proposals before the House Armed Services Committee on 5 May 1958. He highlighted the fundamental problem when he said, in effect, that it is getting more and more difficult to distinguish between missions of the Army, Navy, and Air Force; and that as time goes on and as weapons systems develop, the problem will become more difficult. This is the basic issue which the Reorganization Act does not resolve.

Weapons Development

This situation is the result of an unprecedented acceleration of weapons technology. It is characterized by overlapping firepower capabilities and the desire by each service for a greater share of the total firepower. New weapons and new concepts for their employment are being developed by the three services at a logarithmic pace.

Under the present concept the weapons which are developed and procured unilaterally by the three services will be deployed later and used in joint operations in the various unified and specified commands established by the Secretary of Defense. For example, in the air defense of the Continental United States the Army contributes surface-to-air missile systems. The Air Force provides interceptors and surface-to-air missile systems, as well as

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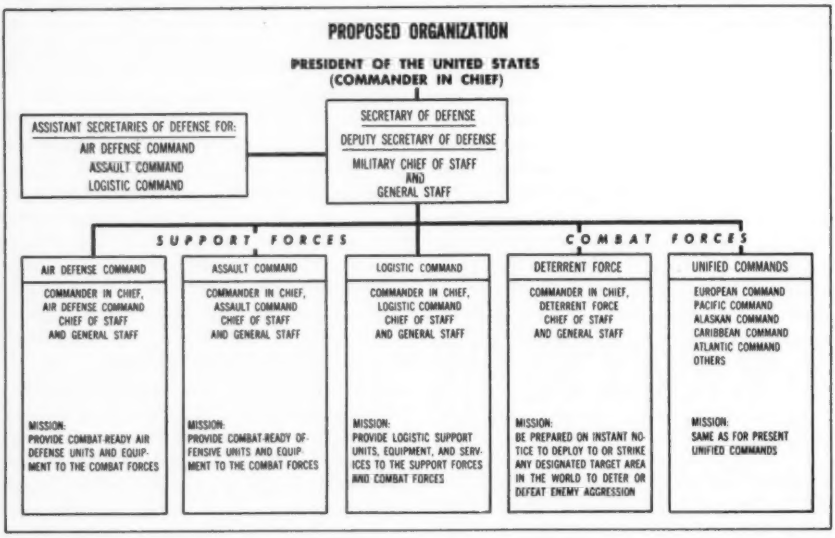
Colonel Seymour I. Gilman was graduated from the United States Military Academy in 1934; the U. S. Army Command and General Staff College in 1945; the Armed Forces Staff College in 1950; and the U. S. Army War College in 1954. During World War II he served with antiaircraft artillery units in Alaska and the South Pacific. Other assignments include duty with Headquarters, Army Ground Forces; senior military advisor to the Operations Research Office, Department of the Army; Commander of the 12th AAA Group in Germany; and first Chief of Staff of the Southern European Task Force (SETAF). Colonel Gilman now is Assistant Chief of Staff, Combat Developments Section, Headquarters, United States Army Air Defense Command, Colorado Springs, Colorado.

the required ground environment including early warning radar and communications equipment. The Navy furnishes airborne early warning and radar picket ships. Each service furnishes the best weapons and equipment which can be provided under its prescribed role and mission and within the funds made available for air defense. However, when deployed together in a common environment to perform a common mission such as assigned to the Commander in Chief, Continental Air Defense Command (one of the new Unified Commands), the mix and deployment of weapons and equipment to provide the best defense for the total national effort involved will be far from the optimum. This result is inherent in the present organizational concept.

In an era of rising costs and limited resources it is essential that expenditures be devoted to the most productive operations and that marginal projects be eliminated. However, the allocation of funds to the services on JCS-recommended force levels on the basis of the present roles and missions does not provide the desired results. Each service is prone to consider its share of the budget as the basis for developing its own strategic concept, objectives, and "pet" projects.

There has been a considerable degree of coordination on these matters at JCS and Department of Defense level, and there will be more control under the new act. However, the various service programs are essentially unilateral and do not necessarily provide a program which best serves the national interest. The present system results in duplicating efforts in some areas, and lack of adequate emphasis in others. This is particularly true in the field of weapons development and procurement which takes the lion's share of the budget. This suggests the need for an organization of forces and allocation of resources on a functional basis.



Other major problems which the Reorganization Act does not solve are:

1. The need for a new deterrent concept based on the integration of all weapons and forces capable of deterrent action

whether projected from land, sea, or air.

2. The need for increased emphasis on air defense by the complete integration of all air defense efforts in order to meet the threat of thermonuclear equipped intercontinental ballistic missiles (ICBM's).

3. The dual responsibilities of the members of the JCS.

Proposed Organization

In the past the introduction of important new weapons systems has been followed consistently by new organizations. For example, the development of the airplane led to the organization of the Army Air Corps and later to the US Air Force. The development of the carrier led to the organization of the fast carrier task force used so successfully in World War II.

With regard to the weapons developed since World War II, attempts have been made both to redefine the service roles and missions to fit the new weapons, and to adjust the service organizations somewhat to accommodate the new weapons. But these efforts, including the most recent one, have been piecemeal actions within the current organizational framework designed to alleviate the symptoms of the problem, but they do not cure it. A radical departure from traditional organization is required to keep pace with the weapons technology. A long-range concept as a guide to future reorganizational actions is most urgently needed.

The proposed organization shown in the figure is designed on a functional basis, in terms of the job to be performed, independent of artificial land, sea, and air areas of responsibility.

The principal features of the proposed organization are:

1. It provides the Secretary of Defense with complete authority and control over all the Armed Forces and military operations essentially as provided for in the Reorganization Act of 1958.

2. It provides a military Chief of Staff and a General Staff in place of the JCS and the Joint Staff.

3. It substitutes functional commands for the present Departments of the Army, Navy, and Air Force.

4. It provides a unified Deterrent Force.

The Secretary of Defense

Under the fundamental principle of overall civilian control of the military the Secretary of Defense retains the same general authority and control of the various forces as he now has with respect to the three services and the Unified Commands under the Reorganization Act of 1958. He also absorbs the functions and responsibilities of the JCS and the Joint Staff. The assignment of a Chief of Staff and a General Staff to his office enables him to carry out these functions. He is responsible for the direct allocation of funds, personnel, and other resources to the various forces. Thus he is in a position to influence directly the balance of effort between the forces and to ensure adequate emphasis on high priority projects.

The Support Forces

The Support Forces include the Air Defense, Assault, and Logistic Commands. These commands provide combat-ready units and logistic support for the Combat Forces but are not responsible for combat operations.

The common functions of the Support Forces include the following:

1. Organizing, administering, training, and equipping combat-ready units and providing them to the Deterrent Force and Unified Commands, as directed by the Secretary of Defense.

2. Support of the Deterrent Force and Unified Commands, as directed by the Secretary of Defense.

3. Determination of qualitative requirements for weapons and equipment required to accomplish assigned missions.

4. Development of doctrines, procedures, tactics, and techniques applicable to their

respective commands and their assigned units.

Air Defense Command

This command is responsible for furnishing combat-ready air defense units and equipment to the Combat Forces. These units are organized, trained, and equipped to provide defense against the entire threat spectrum whether projected from land, sea, or air. This includes the capability for defense against the intercontinental ballistic missile (ICBM), the intermediate range ballistic missile (IRBM, both surface and sublaunched), manned aircraft, air-to-surface missiles, and military satellites. Antisubmarine units are developed and provided by the Air Defense Command because the primary threat of the future submarine will be the use of IRBM's of the *Polaris* type. This then becomes an air defense problem in a functional organization.

The weapons and equipment required to accomplish these operations include surface-to-air missiles; anti-ICBM's; anti-IRBM's; interceptors; ground, airborne, and shipborne early warning radar; fire direction systems; as well as associated ground environment and communication systems.

Assault Command

This command is responsible for furnishing combat-ready offensive units and equipment to the Combat Forces. These units are organized, trained, and equipped for offensive operations, projected from land, sea, or air and irrespective of the range of engagement—from close combat to intercontinental ranges.

The units provided by the Assault Command are capable of the following types of offensive roles:

1. Strategic, tactical, and fleet air operations.
2. Offensive missile operations whether projected from land, sea, or air.
3. Offensive ground operations involving the use of the new pentomic units.
4. Amphibious operations.
5. Airborne and air-landed landing operations.
6. Naval combat support operations.
7. Mine warfare operations.
8. Chemical, biological, and radiological warfare operations.
9. Psychological and unconventional warfare operations.

Logistic Command

The Logistic Command is responsible for the provision of all aspects of logistic support for the Support Forces and for the Combat Forces, irrespective of land, sea, or air application. Each of the commands and the Deterrent Force have only such integral logistic support units and facilities as are required for immediate support of their own respective missions.

The principal responsibilities of the Logistic Command are:

1. Research and development.
2. Centralized procurement.
3. Transportation (including Military Air Transport Service (MATS), Military Sea Transportation Service (MSTS), and convoy operations).
4. Storage, supply, distribution, maintenance, repair, and replacement.
5. Communications.
6. Weather service.
7. Medical service.
8. Real estate and construction.

Deterrent Force

This force is organized, trained, and equipped to deploy to or strike on short notice any designated target area in the world to deter or defeat enemy aggression. It also is used to put out "brush fires" as well as to support or reinforce United States or allied troops overseas, as required. It includes those Air Defense Forces required to protect the Deterrent Force bases from surprise enemy air or missile attack. It is organized by the assignment of appropriate units furnished by the support forces. The force includes aircraft (land or sea based); offensive missiles, such as ICBM, IRBM (ground and

sublaunched); offensive satellites; and appropriate Strategic Army Corps (STRAC) units.

Air and missile operations may be conducted independently, in support of, or in conjunction with appropriate airborne operations. As distinguished from the present deterrent concept based on the use of the Strategic Air Command only, the proposed Deterrent Force ensures the complete use of all ground, sea, and air forces capable of deterrent action and ensures their complete coordination under a single commander. A cellular organization permits all or specified portions of the force to be committed. The necessary air and sealift is allocated to this force on a permanent basis as required for training and operations.

Although the Deterrent Force is, in effect, a unified command, it is designated as a separate force in order to emphasize its importance to the world as the cornerstone of our national policy of deterrence.

Unified Commands

The Unified Commands are established and directed by the Secretary of Defense and essentially have the same missions and areas of operations as are now prescribed by the Reorganization Act of 1958, with the exception of the Strategic Air Command and the Continental Air Defense Command. The Strategic Air Command becomes a part of the Deterrent Force and the Continental Air Defense Command contains all units and equipment required for the air defense of the United States, except those which are assigned to protect the deterrent bases. The Unified Commands are all constituted by the assignment of such units provided by the Support Forces as required to accomplish the mission assigned by the Secretary of Defense.

Advantages

Examination of the proposed organization indicates the following significant advantages:

1. It is geared to concepts of future war and to our national policy of deterrence which may well be our policy as long as the cold war lasts. This policy is based on the availability of a Deterrent Force capable of instant use. The proposed organization broadens the concept of deterrence to include all means of instant offensive operations regardless of range and whether projected from land, sea, or air. This assures full utilization of all deterrent units in proportion to their capabilities.

2. It is organized on a functional basis in terms of mission to be performed, rather than on an artificial land, sea, and air basis. This results in allocation of personnel and matériel resources on a functional basis and ensures that resources are distributed in accord with the requirements of our national policy, rather than in accord with service roles and missions.

3. It has the requisite flexibility to meet the rapidly changing demands of war in the nuclear missile age. The Combat Forces and Support Forces are capable of being tailored to the mission. New weapons will fit into appropriate organizations depending on their functional application.

4. It provides increased emphasis to air defense in an era when inadequate air defense could have disastrous results.

5. It places competing weapons and operations under supervision and control of a single commander. This will serve to reduce unnecessary duplication of effort, and encourage replacement of the less effective weapons. For example, the question of whether to procure missiles or interceptors for air defense, or missiles or tactical aircraft for close support, will be resolved more easily based on operational requirements and on relative cost-effectiveness and not on service roles and missions. This concept will provide improved efficiency and economy of resources.

6. It provides significant economies resulting from centralized procurement for all the Armed Forces.

7. It adheres to the principle of unity of command. All facets of a given operation are directed by a single commander.

Reorganization Problems

A complete reorganization of the present Armed Forces and Military Establishments is required under the new concept. Appropriate agencies, units, and facilities of the Army, Navy, Air Force, and Marines would be regrouped and reassigned as required to fit into the new commands. For example, all surface-to-air missile units regardless of present service would be redistributed to appropriate organizations to meet functional requirements. Appropriate units and facilities of the present Army Technical Services, Air Force Air Matériel Command, and the Navy Shore Establishment would come under the control of the Commander in Chief, Logistic Command.

This regrouping will entail considerable cost, effort, and time. It will engender considerable opposition from Congress because of its traditional opposition to concentration of military authority and to a unified General Staff at defense level. It also will be opposed by the Armed Forces because of service pride and traditions. However, in a critical age with national survival at stake, the choice should be based strictly on the merits of the proposed organization, and not on traditions. In order to make this concept more palatable it should be proposed as an ultimate goal to be implemented over a considerable period of time. In the meantime, all future reorganization actions should be directed toward the achievement of this goal.

In order to retain military combat effectiveness during the reorganization, a suitable target date should be specified about five years hence for the completion of the entire reorganization. This would provide adequate time for an orderly transition during which the reorganization could be effected in phases. The proposed organization lends itself to a phased implementation. In fact, the Reorganization Act of 1958 which strengthened the authority of the Secretary of Defense and gave him the tools for command and control of the operational military forces can be considered as a first step toward the goal. The next step might well be the provision of a military Chief of Staff and a General Staff and the gradual elimination of the JCS structure. When this is a going concern, the establishment of the Logistic Command paralleling the Army, Navy, and Air Force logistic agencies could be initiated. The establishment of a unified Deterrent Force should pose no insurmountable problems. The Army, Navy, and Air Force could be eliminated by attrition, but retained until the last of their units, functions, and facilities were transferred to the control of the new commands and the Deterrent Force.

Conclusion

The present military organization is based on artificial and outmoded land, sea, and air division of responsibilities. It is neither in step with the weapons with which it is being armed, nor does it serve our national policy of deterrence most effectively. This organization promotes duplication of effort and interservice rivalry.

Although the Reorganization Act of 1958 serves to correct some of the most immediate problems, it does not go far enough in resolving inherent weaknesses.

A complete military reorganization designed on a functional basis and phased over a five-year period is needed to provide increased economy, flexibility of operations, and military effectiveness.

For Those Who Can't Be Spared

Colonel William W. Culp, *Armor*
Commandant, U. S. Army Management School

THE idea for a senior Army management school was first conceived in February 1952, when Mr. Karl L. Bendetsen, the Assistant Secretary of the Army for General Management, stated that the commander is the true manager of the Army, and that a vehicle of management instruction for commanders was needed in the Army School System.

A firm of management consultants was engaged in 1953 to make a survey of the Army Establishment to determine the need for management instruction and to develop a plan that would satisfy the requirement. The result was a recommendation for the establishment of a school which would present a three-week course of management instruction patterned after the Advanced Management Program offered to industrial executives at the Graduate School of Business Administration of Harvard University.

It was further recommended that the curriculum be concerned primarily with management of Army installations and activities, and that the school be located in the vicinity of Washington, D. C., where top-level managers of Government and industry could be utilized as consultants and guest speakers.

The plan was approved by the Secretary of the Army. The United States Army Command Management School, with a selected staff and faculty, became a part of the Army School System and formally opened its doors on 28 November 1954. The school is under the jurisdiction of the Commanding General, United States Continental Army Command.

In the spring of 1958 a Department of the Army Evaluation Board was assigned the task, "to evaluate the achievement of the U. S. Army Command Management School of its assigned mission." The board strongly endorsed the operations of the school, and recommended its name be

The distinctive insignia for the United States Army Management School shown above was approved 24 November 1958. Black and yellow are the colors used for the U. S. Army Management School. The commissioned officer's sword alludes to military leadership in developing the managerial ability of installation commanders, selected staff officers, and selected civilians. The quill pen represents the administrative functions. The lamp is symbolic of the knowledge gained through the education and training of the school.

The U. S. Army Management School occupies a vital position in the Army Educational System assisting commanders, selected staff officers, and civilians to perform managerial functions more efficiently

changed to the *United States Army Management School*, since "the objectives of the U. S. Army Command Management School are much broader than that of solely providing technical instruction in the Army Command Management System."

The board further recommended a five and one-half day Army Management Orientation Course for general officers and civilians of comparable seniority.

These recommendations were approved and became effective 1 August 1958.

Mission and Objectives

The mission of the school is to assist *commanders* and *selected staff officers* and *civilians* to perform managerial functions pertaining to installations and activities. Additionally, the school monitors Army management instruction at Army service schools.

As a recognizable goal, the United States Army Management School has established clear-cut objectives which are to:

1. Stimulate and encourage the investigation of broad concepts of good management and to create an intellectual climate for understanding and acceptance of new approaches to Army management problems. The school provides opportunity to study and discuss modern business methods and to assess the merits of their application to Army management.

2. Familiarize participants with Army management methods and their application to management problems of the Army.

3. Develop an increased understanding of the importance and complexities of human relations in Army management. The school provides participants the opportunity to correlate in their own thinking the traditionally sound concepts of command leadership, new management methods, and their own experiences and those of others.

Purpose

The principal purpose of the school is executive improvement and development, including dissemination to participants of the latest thoughts on managerial procedures and techniques. While there is much that is old in Army management, the school is particularly interested in the NEW—in the forward look—in advanced trends and concepts—in conceptual and creative thinking. Its aim is to foster at the school, on the part of the participants, and throughout commands and installations of the Army, an atmosphere wherein *innovation* and new ways of getting things done *more efficiently* and *less expensively* are encouraged.

Colonel William W. Culp was graduated from the United States Military Academy in 1932. During World War II he served with General Headquarters, Southwest Pacific Area. He also is a graduate of the U. S. Army Cavalry School (1936); the U. S. Army Infantry School (1940); the Regular Course of the U. S. Army Command and General Staff College (1947); the Armed Forces Staff College (1949); and the U. S. Army War College (1953). He was assigned to the USA CGSC from July 1953 to August 1958 where he held various positions on the faculty to include Director of Instruction and, prior to his departure, that of Deputy Post Commander. He presently is Commandant of the U. S. Army Management School at Fort Belvoir, Virginia.

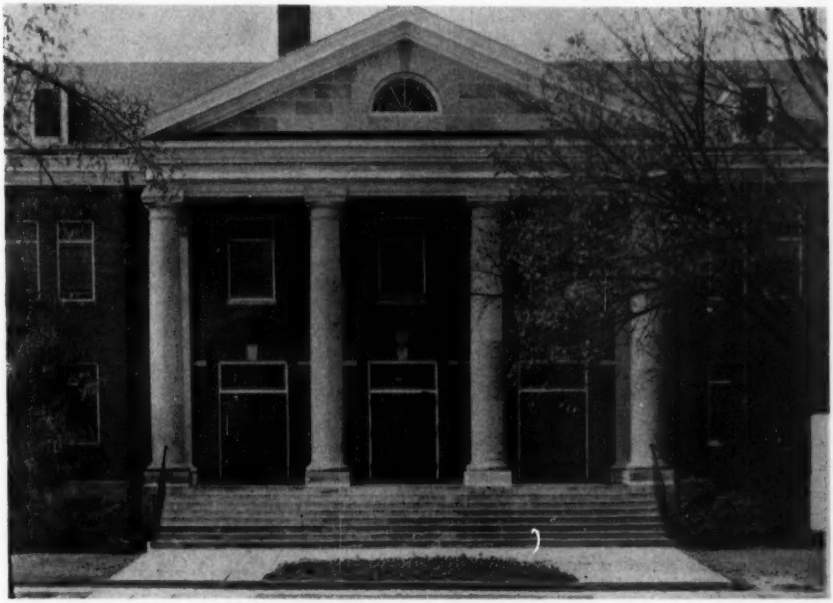
The necessity for good management in the Army cannot be overemphasized. The U. S. Army Management School is making an extremely important contribution to our national defense. Its courses are designed to stimulate creative thought, to inspire enthusiasm for discovering new and better solutions to our management problems. Those selected to attend this school have a rewarding experience in store—one that will do much to enhance the value of their service to the Army as well as to the Nation.

—Secretary of the Army Wilber M. Brucker

Methods of Instruction

The U. S. Army Management School is designed for experienced senior officers holding responsible positions throughout the Army's command structure. These are the officers who will reap the greatest professional reward from attendance, and who will provide the greatest contribution to the Army upon return to their assignments.

The principal methods of instruction are the "case method"; other faculty presentations including lectures, conferences, and seminars; guest speaker presentations; and the constant exchange of information by all class participants throughout three weeks of educational association in a self-contained unit consisting of all academic and adminstrative facilities in one building.



Headquarters, United States Army Management School

A large portion of the instruction is effected through the "case method." A series of cases based on actual situations at military installations and headquarters

The Army has an unceasing requirement to develop new and more efficient means for the accomplishment of its missions. The time has come when we can accept no method of command or management which does not derive the utmost from the resources of the Nation confided to our use. The U. S. Army Management School exemplifies this determination of the Army to obtain the most defensive strength from the means committed to us.

—General Maxwell D. Taylor
Chief of Staff, US Army

is discussed by the class. Each case highlights one or more practical problems in the field of Army management. From the wealth of experience available in each class, a variety of possible solutions is found for every problem. *Every opportunity is provided each participant to explore possible solutions with a view to their adaptability to the local environment of his assignment.*

Since the class contains representatives from installations, major commands, and the Department of the Army, there is an extremely valuable opportunity for the exchange of thoughts and ideas on each situation. Department of the Army representatives are invited to listen to classroom discussions pertinent to their respective areas of staff responsibility. These representatives may volunteer or be asked to give the Department of the Army viewpoint on certain policy matters. Thus a new and valuable link is forged in the communication chain, from the top down, and from the bottom up.

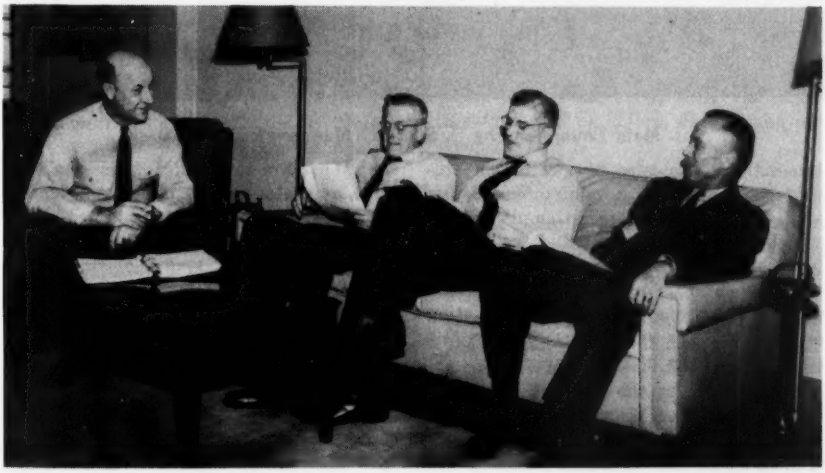
Students attend a lecture in one of the main classrooms at the school

Numerous faculty presentations covering the philosophy and broad spectrum of Army management, including many aspects of the Army Command Management System, are conducted. Eminent guest speakers, who are recognized leaders in industry, education, and the military—se-

In today's Army, those of us who are commanders and staff officers are also managers. We must learn well the principles and practices of management if in these days we are to use wisely and economically the resources entrusted to us. The U. S. Army Management School is performing a vital service in preparing commanders, selected staff officers, and civilians to perform the managerial functions pertaining to their responsibilities.

—General Bruce C. Clarke
Commanding General, USCONARC

Participants in the U. S. Army Management School's first Army Management Orientation Course for general officers and selected governmental personnel take a coffeebreak



A discussion group exchanges information at the U. S. Army Management School

lected for their ability and knowledge in the field of management—supplement the previously mentioned methods and provide current thoughts on a wide range of managerial subjects. The exchange of information by all participants is exploited to the maximum during case discussions, conferences, seminars, and following all lectures.

Additionally the "incident method" of case presentation, popular at the Massachusetts Institute of Technology and elsewhere, is used to generate thought and interest. In this type of instruction students are provided a minimum synopsis of a situation. The class attempts to construct the case by questioning the faculty leader in detail. The class then considers the problem in their discussion groups and arrives at actions required for a solution or solutions. The various groups then discuss the findings of the other groups.

Main Lounge at the U. S. Army Management School

An example of the incident method is the Colonel Peter Wilson case. As executive officer of a depot, he is suddenly confronted with the situation wherein his commanding general has without announcement given a complicated storage problem to a Reserve officer to solve while on two weeks' active duty. The same problem previously had been assigned by the commanding general to his staff, and solution was being supervised by the executive officer. Colonel Wilson mentions to General Kittridge the conflict of interests involved in his decision, only to have a bombshell dropped in his lap with the admonition, "Well, you handle it, Pete."

Typical questions asked by the students are: What are the backgrounds, qualifications, and relative rank of the staff officers and the Reserve officer concerned? How long has the problem existed? What caused the problem? What length of time is required for a good solution? How urgent is the solution? If the Reserve officer works independently, how much information will he require and how can he get it?

Group reactions are many. Some favor using the Reserve officer, a personal friend of the commanding general, as a subordinate staff officer regardless of his rank. Other solutions vary widely from procee●

ing with two separate and independent studies, to utilizing the Reserve officer as an assistant to General Kittridge with sole responsibility for the task.

Throughout all of these demanding and interesting instructional methodologies emphasis is on the ever-fleeting area of problem solving at top military management levels. The basic reason for the Army's existence—to be trained and ready for combat in the defense of our Nation—is kept in constant focus. The school diligently dedicates itself to the theme that ARMY MANAGEMENT *must be aimed at battle readiness of the combat arms and their supporting services.*

Many varied solutions and philosophies are explored. Intelligent questioning and thoughtful doubts are encouraged. Dogma is not preached. Pat solutions and formal answers are attacked. Uninhibited expression of fruitful ideas is urged in an atmosphere of complete academic freedom. Each student is challenged to analyze himself and his past actions—is encouraged to make a thorough appraisal of his present managerial behavior—and to take a scrutinizing forward look at his future management intentions. Every student is afforded ample opportunity to think for himself, to project himself into a problem situation, and to think responsibly on the particular situation, affected by facts, by his own thoughts, and the thoughts of others.

Faculty

The faculty keeps abreast of current Army practices, and projects its thoughts and efforts into the future, by constant liaison with the Department of the Army, Headquarters United States Continental Army Command, and other Army echelons. Frequent research visits to installations and agencies are the fingers on the pulse of day-to-day practices and the fruitful ideas of the many who are "doing the job."

Faculty members are selected from those with the inclination, background experience, and education to promote modern, reasonable and far-reaching approaches to solutions of the vast arena of Army management problems. Today's battleground of management challenges is a chain reaction of limitless areas. To prepare themselves for the realities of intelligent reasoning, discussion, and instruction in these demanding areas, faculty members attend leading universities, executive courses of major industries, and instructional courses of the American Management Association. They maintain continuous liaison with educational institutions and organizations, as well as management associations, and participate in their programs on an invitational basis.

Command, management, and leadership substantially are the same; the terms virtually are synonymous. While disagreement with some tenets of such a theme is to be expected—and intelligent discussions thereof are both engendered and encouraged at the school—it is undeniable that MANAGEMENT is a requirement of *peace* and *war*. MANAGEMENT is *old*; and MANAGEMENT is *new*; it is *tactical* and *nontactical—administrative* and *strategic*. It is ubiquitous—and ever with us; it challenges us in the conference room and in the battle area. Its requirements engulf us *before*, *during*, and *after* combat.

Conclusion

The United States Army Management School is designed for mature officers who occupy responsible positions *Army-wide*. The courses are for general officers, colonels and lieutenant colonels, and for civilians of GS-13 rating and higher. Twenty-one hundred, including one hundred general officers, have already graduated. The course is for those who play important roles in service to their Nation—for top Army manager-leaders—for those whose time and talents are valuable and difficult to spare.

KEEPING PACE WITH THE FUTURE--

Education for Leadership

Colonel Walter M. Vann, *Artillery*
Faculty, U. S. Army Command and General Staff College

This is the thirteenth in a series of articles expanding various aspects of "USA Command and General Staff College Keeps Pace With the Future," written by Major General Lionel C. McGarr, USA, Commandant of the College, and published in the April 1957 issue of the MILITARY REVIEW. *—Editor.*

EIGHT "courses of study" are listed in the 1958-59 Regular Course Program of Instruction at the United States Army Command and General Staff College, as follows:

Infantry Division—
Armored Division—
Airborne Operations, Army Aviation, and Unconventional Warfare—
Larger Units and Administrative Support—
Future Warfare—
Basic Nuclear Weapons—
Staff—
Educational Subjects—

The purpose of this article is to discuss ways in which the educational philosophy represented by the Educational Subjects course of study is applied in the USA CGSC curriculum.

"Educational Subjects Course of Study"

Purpose: *To provide the student with a basis for the long-term development of his values, standards and theoretical knowledge as a professional soldier. Although the entire curriculum contributes to this purpose, these specific educational subjects reinforce the graduate's over-all value as a commander or general staff officer. They are selected to help produce a well-rounded professional soldier with the ability to apply mature discrimination in his daily activities and decisions for the remainder of his career. The treatment of learning is basically educational. While separate, this instruction reinforces with sound theory instruction in all other departmental courses of study.*

This statement appears in the Commandant's Guidance and Decisions on the /9 Regular Course at the United States Army Command and General Staff College, published 15 November 1957. There have been numerous changes in material covered but, as would be expected in a long-range project of this type, the basic purpose with minor change applies to the /60 Course. Note that the purpose of the course of study includes development of intellect, not intellectual*ism*. Note also that the accomplishment of this purpose is not confined to the Educational Subjects, and that the selection of subjects is such as to make a practical contribution to daily activities, in peace or war.

The Educational Subjects[1] course of

[1] "Keeping Pace With the Future—Molding the Staff," Colonel Walter M. Vann, *Military Review*, May 1958.

The purpose of the Educational Subjects presently taught at USA CGSC is to assist in the development of intellect to help produce a professional soldier with the ability to apply mature discrimination in his daily activities and decisions for the remainder of his career

study for 1958-59 is shown in Figure 1. Knowledge of these areas has been, is, and will remain fundamentally important to a commander. It is not possible for

EDUCATIONAL SUBJECTS
COURSE OF STUDY
1958-59

Military History
Military Geography *
Military Organization and Management*
Legal Status of the Military *
Military Leadership *
Comparative Military Systems

* Includes Guest Lecture.

Figure 1.

USA CGSC to conduct a complete "course" in any one of these subjects, nor would this be appropriate. What is necessary is a sound sampling to create general understanding and a foundation for future self-development. These general areas are suitable for development not only in the Educational Subjects but also in the other courses of study at the College. As will be explained later, every subject in the curriculum contains features which amplify broad education.

It should be made clear that the allocation of time to Educational Subjects is not the only control on educational content in the curriculum. Of the total 1,146 curriculum hours for /9, 40 percent must be advanced application and broad education.[2] The time for Educational Subjects is part of the "broad education" portion of this 40 percent. This ensures that the entire course contributes to long-term development and has an appropriately balanced approach, but still qualifies an officer thoroughly for tactical and logistical staffs. Another requirement (also within the 40 percent mentioned before) is that one-third of the Staff course of study be advanced application and broad education. *Advanced application* is coupled with education because in this phase the student does not study new material, but uses what he has already learned to solve ever more complex problems. By this means he acquires a greater depth of understanding and ability to handle difficult situations rapidly and effectively. Additional curriculum controls which ensure achievement of the educational purpose are mentioned later.

The purposes and scopes of each subject in the Educational Subjects course of study have already been explained in an earlier "Keeping Pace" article. Therefore, to avoid centering too much on one course of study and distorting the picture of the entire curriculum, the technique used from here onward will be to outline USA CGSC organization for general education. This will be followed by an examination of elements of two major military fields—(1) the environments in which United States

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Colonel Walter M. Vann was graduated from the United States Military Academy in 1939; completed the 13th General Staff Course of the U. S. Army Command and General Staff College in 1943; attended the Armed Forces Staff College, 1952; and was graduated from the U. S. Army War College in 1956. He served with G4 Headquarters, 12th Army Group, in Europe during World War II. Other assignments include duty in G4 Plans of Headquarters, US Forces, European Theater and European Command; G4, Department of the Army; AAA Battalion Commander and G3 Executive at the Antiaircraft Artillery Guided Missile Center; G3 Plans of US Army, Europe; Assistant Deputy Chief of Staff for Operations, Headquarters, USAREUR; and Commander, 1st AAA Group, Seventh Army. He is the author of "Antiaircraft Defense," and "Keeping Pace With the Future—Molding the Staff," which appeared in the January and May 1958 issues of the MILITARY REVIEW. *Assigned to the USA CGSC in July 1956, he now is Director of the Department of Staff and Educational Subjects.*

[2] *Ibid.*

Army forces and USA CGSC graduates may be required to operate, and (2) typical problems which graduates must be prepared to meet during these operations —to bring out the practical contribution which broad education at USA CGSC will make toward qualifying graduates for these conditions. This examination will include the effect of both the Educational Subjects and all other allied instruction at Leavenworth. Finally, the philosophy which governs this educational approach will be compared with philosophy developed in an authoritative study of the over-all problem of education in the United States.

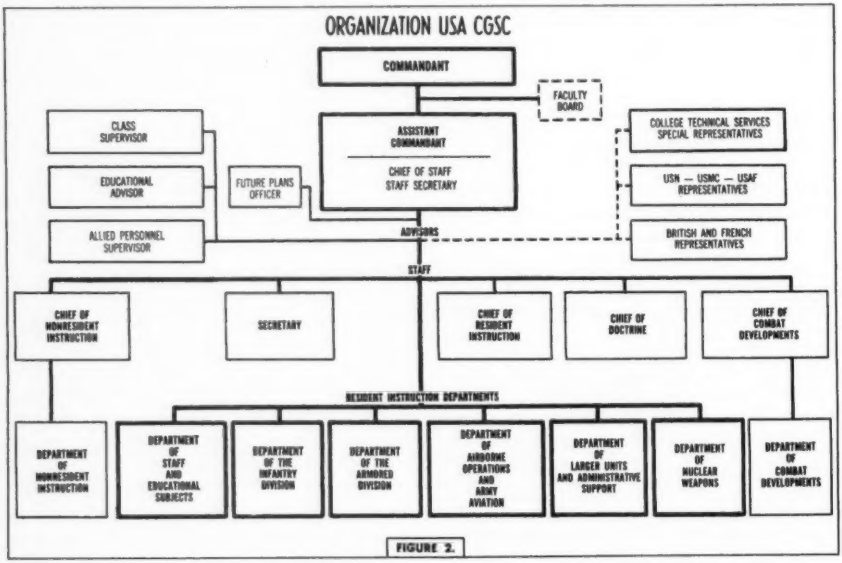


FIGURE 2.

Educational Background

Before the 1957-58 reorganization of USA CGSC *each* resident instruction department presented material of a broad educational type. About the same amount of time was devoted to this type material as is now allocated for the Educational Subjects course of study.

Since the reorganization of the College in December 1956 and establishment of general education subjects as a single course of study, one department has been responsible for providing a cohesive approach and selecting appropriate subject matter to create a unified course of study which would achieve the desired purpose —for "weighing of essentials and nonessentials" and providing "educational guidance."[3] This course of study provides a basic element of the qualifications required by commanders and staff officers in all commands in which the College centers instruction. Since it is, therefore, similar to and closely allied with the Specific Staff course of study, the responsibility for Educational Subjects is assigned to the Department of Staff and Educational Subjects (DSE), avoiding establishment of a separate department for only 90 hours of

[3] *The Pursuit of Excellence: Education and the Future of America.* Copyright 1958 by Rockefeller Brothers Fund, Inc. Reprinted by permission of Doubleday & Co., Inc.

instruction. The position of DSE in USA CGSC organization is shown in Figure 2. The Department is organized into two sections, one for each of its courses of study.

This centralization has also allowed development of instructors who understood thoroughly, and could do a superior job of teaching the broad categories of subject matter which would make up the course.

An earlier article [4] has explained how the advice and assistance of civilian educational institutions made possible the rapid selection of materials and design of subjects for this new military education course of study. All civilian educators who have worked with USA CGSC have contributed for the sole purpose of making the course a success. They have made no attempt to "dictate" its content or method of conduct.

Operational Environments

The President, the Secretary of State, the Chief of Staff of the Army, and many other authorities have emphasized: the cold war will probably be protracted; limited, or local wars are highly probable; general war, while a remote probability, is so menacing to the future of the United States and the world that there must be complete readiness to deal with its many implications. This range of possible types of war may involve United States Army divisions, corps, armies, and supporting administrative commands in operations almost anywhere in the world.

The geography of possible areas of operations or deployment of Army forces may vary from desert heat to mountain cold, from jungle swamp to Arctic ice. The areas may be highly developed or primitive, politically and economically advanced or backward, culturally mature or relatively unsophisticated. The population may be friendly or hostile, passive or violently partisan but closely controlled, technologically skilled or uneducated.

Friendly forces are likely to vary as widely as the physical and social characteristics of the area. Local national forces may be loosely organized, lightly armed troops or heavily equipped and organized in a fashion similar to United States forces. They may include guerrillas and paramilitary elements.

In the worst possible case, the area of operations may be the United States itself in a general thermonuclear war. Here the problem would be completely different, insofar as the area, population, and economy and the problem of moving and supporting forces are concerned.

Roles of a USA CGSC Graduate

In this great variation of environments with their differences in operational conditions, the roles and missions of Army units and of the USA CGSC graduates assigned to them will be quite different from those of comparable units and personnel of the past. With the wider dispersion of units and absolute necessity for greater decentralization of authority, more responsibility will fall on each command from field army downward. In situations short of war, only one division may constitute the US Army element of a joint or combined force. In local war, or in certain theaters in a general war, a field army headquarters may be the senior United States Army element.

USA CGSC graduates are assigned to positions appropriate to their grades in joint, departmental, and combined staffs. They will be expected to participate in the formulation and execution of policies, programs, and plans which take into account the inseparable linking of military and nonmilitary influences in military organization and operations. This interrelationship of military, political, economic, and psychological factors is an inescapable fact of life at the highest levels of joint and combined military and civil-military organization. It is also an influence of major significance in the division, corps, field army, and other field commands. USA CGSC

[4] Vann, *op. cit.*

graduates must be prepared to work closely, in assignments appropriate to their grade, with foreign affairs experts, industrial managers, scientists, and labor leaders.

Few national policies, programs, or plans in the United States do not involve the military forces of the Nation, be it as direct means of execution, as supporting instruments, or as a huge population group to which policies are applied. The Pentagon assigns missions, issues broad policy, guidance, and allocates resources among and within services and major subordinate commands. Policies, programs, and plans are, in the final analysis, carried out by the commanders and staffs of divisions, corps, field armies, and supporting tactical and administrative support commands. The breadth of vision and depth of understanding necessary in the Pentagon must be paralleled to an appropriate degree in the field.

Environmental Education

When the /8 curriculum was being planned in detail, it was recognized that instruction would be unrealistic and unbalanced if it failed to create an appreciation of the influence of operational environments and roles of the Army on the operations of units. This was recognition of the basic fact, often overlooked because of its obviousness, that operations do not take place in a vacuum. Accordingly, a conference attended by representatives of US CONARC and Department of the Army was held at Leavenworth in March 1957 to examine "Roles and Operational Environments of the Army in the Field." Study of the results of this conference led to College conclusions on the degree to which various types of war should be dealt with in the curriculum and the emphasis which should be given to different geographic areas of the world. Based on these conclusions, the numerous problems in the course are given "strategic settings." Figure 3 indicates world areas in which USA CGSC problems have been and are located.

The strategic setting for a problem establishes the type of war being conducted and the over-all conditions surrounding the particular operation. The nature of the enemy and the nature of friendly force organization are covered. While the enemy is always AGGRESSOR, his organization and method of operation are based on the situation and the characteristics of the area of operations. Other elements of the strategic setting are the actual conditions which exist in that particular part of the world, to make problems as realistic as is possible within security limitations. Strategic settings obviously are not based on, nor do they have any connection with, plans or policies of the United States Government or Department of Defense.

These strategic settings cover, in a great deal more detail, selected portions of the major world areas dealt with in the regional analyses carried out in Military Geography. They help to develop a broad appreciation of the way differences in operational environment influence military organization and doctrine, and the capabilities of a nation to conduct a particular type of warfare. In these respects, strategic settings are closely related with and reinforced by Military Geography, Comparative Military Systems and, in the Staff course of study, Comparative Staff Systems. In turn, Military Geography helps prepare the student to consider all the characteristics of an area as they have an impact on military decisions. The effect of this is to prepare him *better* to perform duty as a commander or general staff officer and to give him an improved basis for future thought on military problems and for future study and decisions.

The distribution of strategic settings for problems shown in Figure 3 is not accidental. The educational effect of different subjects and the size of the subject matter "sample" in each is controlled by the number of hours planned for the sub-

ject. The percentage of the curriculum which will be set in each form of war is also controlled by curriculum planning guidance. The distribution of strategic settings is carefully planned to be worldwide to ensure that modern environments and areas of possible future interest to the Army are adequately represented, as well as to reinforce the fundamental instruction in Military Geography.

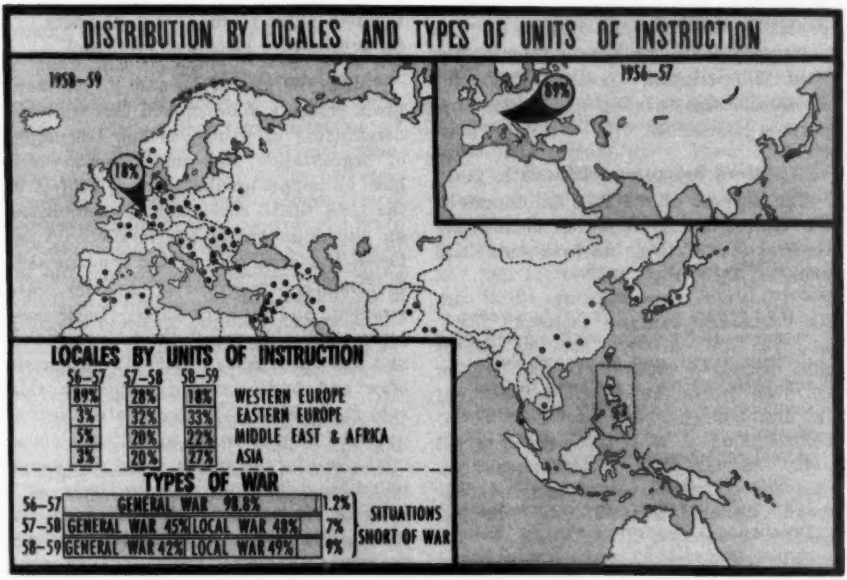


Figure 3.

"The Army and National Security," a subject in the Staff course of study, orients the student on the National Military program of the Chief of Staff, US Army, and on the forms of war and modern roles and environments of the Army. It provides a general background for viewing national security problems. The reasons for the many international military commitments of the United States can be better understood by students by reflection on this subject in connection with the basic understanding of world matters obtained from Comparative Military Systems, Military Geography, and Legal Status of the Military.

In Comparative Military Systems, study of the military systems of the United States, Great Britain, France, Germany, Soviet Russia, and Communist China, gives the student an insight into the characteristics of each system and the influences which have led to these characteristics. The student compares their strengths and weaknesses for conduct of general war, local war, or actions short of war. He obtains a basis for determining their possible future development as a result of their past history and the basic influences which will continue to affect them. This subject reinforces the knowledge of force structures gained from the strategic settings and allows the student to fit into place all his tactical and administrative

support learning. It forms a basis for evaluating the forces of other nations with which graduates may work in peace or war, and for background in shaping plans on and off the battlefield. Intelligence instruction from the entire course also applies to this field. Personnel and civil affairs matters are integrated to provide a complete picture of the forces of major powers. Logistics and its influence on military doctrine and tactics and organization are brought into focus. The point of focus is, as appropriate for the level of instruction at USA CGSC, the divisions, corps, armies, and major supporting commands.

Broad Assignment Education

The purpose of the Regular Course at the United States Army Command and General Staff College has been stated and analyzed as: [5]

To prepare officers for duty as commanders and general staff officers at division, corps, and field army including their logistical systems, the communications zone and its subordinate elements, and the theater army personnel replacement system.

This involves: (1) the ability of USA CGSC students to perform these functions, as appropriate to their ranks, immediately *upon graduation in* peace or war; *(2) their ability, based upon USA CGSC education, to* improve and progress *over the years* after graduation *to perform these functions* at the highest ranks in peace or war; *(3) Their ability* to adjust *to likely conditions of* future war; *and as an implied responsibility, (4) their ability satisfactorily to perform* in a wide variety of worldwide field grade staff positions at nontactical headquarters immediately upon graduation, *in accordance with established Department of the Army manning requirements.*

In the years since World War II the roles of the United States Army have been transformed. In 1939 United States Army officers had not been assigned to combined commands and staff duty for 20 years. Now many field grade Army officers serve in international headquarters or help in training allied forces; great numbers are in units under combined command.

Military Organization and Management gives students a broad and thorough understanding of principles and techniques of organization and management which have an impact on almost every subject in the USA CGSC curriculum. It establishes an understanding of the relationship between the organization and management problems and practices of industry, government, and military forces. Basic concepts applicable to all three are studied and discussed. As a result of the knowledge and understanding gained in this subject the USA CGSC graduate is better equipped to participate in military-industrial, military-economic, and military-scientific discussions constructively and with benefit to both sides. He is in no sense a professor of industrial relations or business administration, but he does have an understanding of the elements of organization and management in those fields which are pertinent to military matters. This includes the obligations of such organizations as a part of the Nation, as employers of large numbers of people, and as influences on the world's economy through their personnel management policies and practices.

The basic knowledge and perception established in this subject is improved in Comparative Staff Systems and Comparative Military Systems, mentioned earlier. It is furthered by experiences in all prob-

[5] "Keeping Pace With the Future—Resident Instruction at USA CGSC," Colonel James L. Frink, Jr., *Military Review*, February 1958.

lems in studying the organization of military units and determining how to combine them into effective task groupings and to take advantage of sound organization to allow them to work together in an integrated manner. "Advanced Appreciation of Staff," a Staff subject, combines with Military Organization and Management to allow the student to consider future influences on staff organization and activities and to lay the groundwork for making changes which the future is sure to require. In Theater Administrative Zone problems in the Larger Units and Administrative Support course of study the students receive effective demonstration of the application of organizational functions to practical problems. The problems involving Technical and Administrative Service organizations and operations bring out clearly the vital effect on the Army of the different possible methods of grouping functions and assigning responsibilities in different types of organizations, and the influence of management techniques on responsiveness to the requirements of supported commands.

Military History serves a number of purposes. The value of studying this subject has become much more widely recognized since World War II among civilian educators. For the USA CGSC student the values of the subject as a means of gaining vicarious battle experience are made clear. The student is introduced to methods of study and use of historical material as a means of improving his decisions on military matters in general. Historical examples have been used generously for some years in all departments at USA CGSC. The specific subject provides students a better understanding of the proper way to view these examples, to analyze them, and to draw lessons from them or determine that apparent lessons are in reality misleading.

Based on the teaching in this subject, other courses in the curriculum use historical cases and examples to provide a basis for analysis of situations and to allow comparison and analysis of changes in tactics and organizations. The historical development of army corps and field armies, and of the organizations supporting them are presented to give perspective to the current types of organization and prevent the false impression that the present is the last word rather than merely a stage in an evolution which must continue in order for the United States Army to meet changing conditions in warfare.

Military History is closely allied with and assists the student in the subject on Comparative Military Systems (discussed later) and Comparative Staff Systems (part of the Staff course of study). The latter subject provides a concrete application of the methods of study and use of military history in examining the evolution and interaction of the staff systems used in the armies of major world powers.

The historical coverage throughout all courses of study provides an excellent insight into the extent to which both tangible and intangible factors have affected military commanders and staff officers in the past. It is a sound method for demonstrating how certain qualities have contributed to success and failure, and how values and standards, changing or stable, have contributed to the effectiveness of military forces and nations or have led to their disintegration under pressure. Military history is used to bring out the fateful oversights in the field of civil affairs and logistics which caused campaigns to fail or to be imperiled. It is also a means for bringing out the true meaning of mobility on and between battlefields, and the decisive effect of lack of mental mobility by a high commander.

The role which the Army might be called on to assume in the domestic emergency conditions attendant on a thermonuclear attack on the United States surpasses in scope and magnitude anything the Army

has ever had to do to aid civil power. The problems which could arise as a result of interruption of communications, services, essential civilian supplies, and governmental authority, combined with massive destruction and astronomical casualties are staggering. One complicated aspect of such problems is the authority which military commanders would have in the wide variety of situations they would meet. On the one hand, there could be no hesitation or failure to take necessary action. On the other hand, military commanders in such situations would have the possible capability to do untold damage to the way of life of the United States in the future by unsound decisions, and to damage themselves and their subordinates in the eyes of the Nation by illegal actions. Legal Status of the Military lays a foundation for wise action, soundly based in law, by military commanders and staff officers in such catastrophic conditions and also in natural disasters which take place in peace or war, such as the Texas City explosion, or the 1953 Netherlands flood.

In a sense, the law of land warfare is the ethical basis for the existence and operations of military forces. The international conventions and agreements between nations on the exchange of forces between countries and their use in peace and war establish both legal and moral responsibilities on military commanders which affect the actions they take to accomplish many types of missions. Problems in all courses of study at the College bring out the application of many of the principles dealt with in Legal Status of the Military. Also, the settings for all problems indicate the basis for the use of United States forces and any legal or other restrictions on their operations and the authority of their commanders.

This subject and subsequent application of many of its basic legal principles provides an awareness by the student of the relationships of military and civil authority under the United States Constitution. A sharp and effective contrast is created with the lack of moral restraint on use of military power by the USSR and the lack of respect for human dignity and aspirations within Communist armed forces.

Leadership

The subject of leadership is basic to the entire curriculum. The specific subject on "Leadership" is the basis for all subsequent instruction in leadership, and for the leadership aspects of all problems. Whether the problem is one of staff organization, procedure, personnel, intelligence, operations, logistics, or civil affairs, it will entail consideration of some phase of leadership, for leadership pervades every problem in some way. This educational subject might be classed as the center of values and standards, tangible and intangible, for the curriculum.

The subject is not used to "teach" students leadership. Rather, as the approach to leadership at the relatively high levels appropriate for the Command and General Staff College, the students are guided in obtaining an understanding of the problems and principles of establishing an effective environment of leadership in commands at these levels. There is always strong emphasis on the fact that *the individual soldier* is the basis of all military operations, even though leadership is dealt with from the viewpoint of a higher commander and staff officer.

Mature discrimination in the daily activities of an officer of the United States Army involves much more than a knowledge of the military aspects of tactics, unit organization and capabilities, staff organization and procedure, and the ability to use this knowledge efficiently. Day-to-day impressions of the United States, of its motives, its objectives, its reliability and its strength are established around the world by the people in daily contact with

the United States Army. The nature of these impressions is largely dependent on the wisdom of field commanders and staff officers and their understanding of the attitudes of their troops, the local civil population, and the military forces with whom they share a common purpose—the defense of freedom.

The values and standards which are the foundation of the United States Army are daily made clear by the actions of its members. The attitudes of individual soldiers and officers, and the attitude of commanders toward them are shown in garrison, in field training exercises, and in battle to the population in many locations through the world. It is impossible to overemphasize the importance of the attitude shown by members of United States Army forces. National conceptions of the United States are derived from what people see of US Army forces, and national actions with regard to the United States will be based on these conceptions.

Education in the United States

Report V of the Special Studies Project of the Rockefeller Brothers Fund[6] (hereafter referred to as the Rockefeller Report) published in July 1958 was a survey of the purposes, problems, and action necessary for education in the United States to play its part in assuring the survival and continued development of the nation. The report contained these statements:

Excellence . . . is a product of ability and motivation and character. And the more one observes high performance in the dust and heat of daily life, the more one is likely to be impressed with the contribution made by the latter two ingredients. . . . A challenge must be recognized before it can be met. Our society will have passed an important milestone of maturity when those who are most enthusiastic proponents of a democratic way of life are also the most vigorous proponents of excellence. . . .

It is important to accept the desirability of a rigorous reappraisal of present patterns and courageous experimentation with new patterns. This must include a candid weighing of essentials and nonessentials in the curriculum . . . and—at the level of higher education—the trying out of approaches which place more responsibility on the student for his own education. . . .

The heart of the matter is that we are moving with headlong speed into a new phase in man's long struggle to control his environment, a phase beside which the Industrial Revolution may appear a modest alteration of human affairs. Nuclear energy, exploration of outer space, revolutionary studies of brain functioning, important new work on the living cell—all point to changes in our lives so startling as to test to the utmost our adaptive capacities, our stability and our wisdom.

There is a danger, however, of training scientists so narrowly in their specialties that they are unprepared to shoulder the moral and civil responsibilities which the modern world thrusts upon them. . . . We cannot afford having our most highly educated people live in an intellectual isolation from one another, without even an elementary understanding of one another's intellectual concerns. . . .

We cannot measure the rare qualities of character that are a necessary ingredient of great performance. We cannot measure aspiration or purpose. We cannot measure courage, vitality or determination. . . . The objective of all educational guidance should be to stimulate the individual to make the most of his potentialities. . . .

What most people . . . want is . . . meaning in their lives. If their era and their culture and their leaders do not or cannot offer them great meanings, great convic-

[6] Rockefeller Report, *op. cit.*

tions, then they will settle for shallow and trivial meanings. . . .

Educational Goals

"Ability, motivation and character"—These, set as goals in the Rockefeller Report, are the qualities which a graduate of the United States Army Command and General Staff College must possess to be adequately prepared for duty as a commander or general staff officer. "Values, standards and theoretical knowledge" is another way of expressing the same qualities. It is not at all surprising that the fundamental purposes of USA CGSC and of United States education are the same, for both are concerned with developing students whose conduct must be in consonance with the objectives for which the United States was created, and without which it cannot survive.

The world *is* being subjected to change of staggering scope and speed. The shocks of nuclear fission and fusion overwhelmed men's imagination. Before the implications of this force had been assimilated, rocket propulsion expanded astronomically the distances and the speeds of travel to which men might aspire. Simultaneously, electronics and automation began to show promise of multiplying by hundreds or thousands the mental and physical capabilities of one man. In December 1958 came a statement that interpretation of data gathered during the International Geophysical Year would keep scientists busy for a hundred years. This is the type and the rate of change which challenges USA CGSC and for which it must prepare its graduates, change characterized by the Rockefeller Report as a test "to the utmost."

As world conditions change, their meanings must be reexamined by the US Army. Old relationships are being altered; new ones arise. New problems are taking shape. Many important issues dwindle while others, still important, are obscured. Deluged with new and unfamiliar factors to be fitted into place, commanders and general staff officers must have broad intellectual capacity to discern relevant facts and to comprehend their true meaning.

Education at USA CGSC helps students to find meaning in change so that they can contribute to progress. It provides a framework within which they may fit thoughts to retain mental perspective, and discern *where* progress can be made. It assists them to relate facts and develop theories as to their meaning, to decide *how* progress should be achieved. It sharpens their perception, makes them less likely to be deceived, more receptive to necessary change, and less likely to be misled into seeking change merely for its own sake. It improves their ability to make decisions, the quality of their decisions, and their ability to act on them.

The College can do none of these things, however, if it becomes static and thus falls behind the times. It must change from one year to the next, and even within the year, to keep pace with the world. And the problems of keeping education abreast of the times, of making it adequate as a preparation for future conditions, arise primarily from the presence of two main groups of elements in education, one stable and one continually changing. Values and standards are the stable framework of education. Facts to be fitted into place are the variables.

Communism has the objective of world domination and "reeducation" to change. Recognizing that leadership can be most effective in changing situations, the Kremlin asserts its doctrine immediately. Communism's leadership is aggressive, resourceful, flexible, and tireless. That it is also deceptive, amoral, and destructive does not lessen its eagerness to deal with problems and offer solutions. With this type of leadership we should expect education in the USSR to be as efficient, effective, exhaustive, and balanced as care-

ful calculation and ruthless drive can produce, but to be devoid of moral standards. Military and national education will be planned and, insofar as possible, conducted for the sole purpose of yielding maximum effective power at a time advantageous to the USSR.

Soviet education cannot only afford to use "brain washing"; the technique is essential to cover the absence of basic human values. Communist techniques provide a frightfully effective, dedicated, and purposeful motivation of military and civilian leaders in their system, which we must match or go down in defeat. American society, however, cannot perpetuate itself without sound values, nor can the Army fulfill its tasks without a basis of individual values, laid in the home, as its starting point. But we cannot use Communist techniques for they are as sure to be quickly self-defeating for the United States as, in the long run, they will lead to internal decay in the USSR.

Summary

Leavenworth has always produced officers who, in command or general staff positions in war, could plan the movement and support of forces in the field and control and coordinate the operations of combat and administrative support units. Masters of the estimate of the situation, the operations and administrative plan and order, and all the other command and staff processes for arriving at and executing sound tactical decisions, have been produced in courses as short (in World War II) as 11 weeks. The Leavenworth student still receives this type of education. He masters even more complex situations and learns to use a wider variety of units which have a substantially greater range of capabilities and improved operational flexibility. But in addition, he must possess the qualities of character and professional values and standards which will stand the test of any pressure and permit him to reach calmly reasoned, sound decisions and provide inspirational leadership to the subordinates who must carry out his decisions effectively and efficiently. Even if the course at Leavenworth were concerned only with staff, it would be dangerous to omit any of these things. But in a command *and* staff College they are all mandatory.

Of the eight courses of study in the 1958-59 Regular Course curriculum, totaling 1,146 hours, seven deal with specific education in tactical and administrative support operations, staff organization and procedure, and concepts for use of field commands. These courses of study have been thoroughly discussed in previous articles of the "Keeping Pace" series. Means by which character, values, and standards are developed has been dealt with by the Chief of Resident Instruction in "The Moral Basis for Instruction."[7] This article has shown how broader education is provided in accomplishing the purpose of "continuing development of the moral as well as the physical and mental side of the student—the development of the complete MAN."[8] In general, it indicates some of the measures used by the USA CGSC to develop the type leadership which is essential in the United States Army.

General George C. Marshall once stated, "Ours is a world of nuclear giants and ethical infants." The College is dedicated to ensuring that this will not be true of American commanders and general staff officers. Education for leadership is never finished; the "Pursuit of Excellence" is unending. The ceaseless search for improvement in the annual curriculum planning cycle ensures that the USA CGSC will never become complacent. Leavenworth is, and will stay, educationally *ahead* of the pace of the future.

[7] "Keeping Pace With the Future—The Moral Basis for Instruction," Colonel Hughes L. Ash, *Military Review*, March 1959.

[8] "Keeping Pace With the Future—Fort Leavenworth Develops the COMPLETE Man," Major General Lionel C. McGarr, *Military Review*, October 1958.

MILITARY NOTES AROUND THE WORLD

UNITED STATES

Flamethrower Kit

A flamethrower kit under development will be capable of selective mounting on a variety of combat vehicles, converting them to effective mechanical flamethrowers. In an experimental test, mounted on an *M59* personnel carrier, the flamethrower had an effective range of about 180 yards.—News item.

Plastic Lifeboat

A plastic lifeboat has passed severe tests and has been approved by the United States Coast Guard for installation on American-registered cargo and passenger vessels. The rigorous tests given the boat included being swung against a steel bulkhead while loaded with almost four tons of sandbags, and a free drop of 10 feet into the water while fully loaded.

The vessel which is 24 feet long and eight feet wide has a capacity of 40 persons. It is light in weight and impervious to rot, corrosion, and exposure. The stem and stern posts of the boat are of aluminum construction and fittings are stainless steel. All other parts are made of fire-resistant plastic. Plastic foam material is installed in such quantity that the boat is unsinkable even when fully loaded and completely filled with water.—News item.

Lightweight Steam Engine

A lightweight steam engine for use in 28-foot personnel boats is under evaluation by the Navy. The engine, which develops over 200 horsepower, does not require a transmission, clutch, or reverse gear, but drives the propeller of the craft directly. The 400-pound engine is driven by two double-acting cylinders and has a more favorable weight-to-horsepower ratio than comparable engines now in use. —News item.

Commuted Ration Up

The value of the commuted ration for United States enlisted men has been increased from $1.10 to $1.15. Commuted ration allowance is paid to enlisted men on leave or authorized to ration separately.—News item.

Work Uniform

The Air Force officially has adopted the Army's fatigue uniform as an effort in support of interservice supply standardization. The action is expected to result in an annual saving of over three million dollars. The current Air Force utility garments will continue to be the official work uniform until present stocks are exhausted. —News item.

Potent Missile

Jet fighter aircraft of two carriers of the Pacific Fleet have been armed with the Navy's air-to-air guided missile, *Sparrow III*. The latest version of the *Sparrow* (MR, Aug 1957, p 68) is 12 feet long and weighs 350 pounds. It is equipped with a guidance system employing new radar techniques that considerably increase its range and permit greater flexibility in its use. The pilot can fire the missile at a target without seeing it, since the radarscope indicates when the target is within range, or the missile can be set to fire automatically. The *Sparrow III* is fitted with a warhead 50 percent more powerful than that of its predecessors.—News item.

Biggest Earthmover

A self-loading earthmover, said to be the largest such device ever built, uses the "electric wheel" system of propulsion (MR, Jun 1957, p 62).

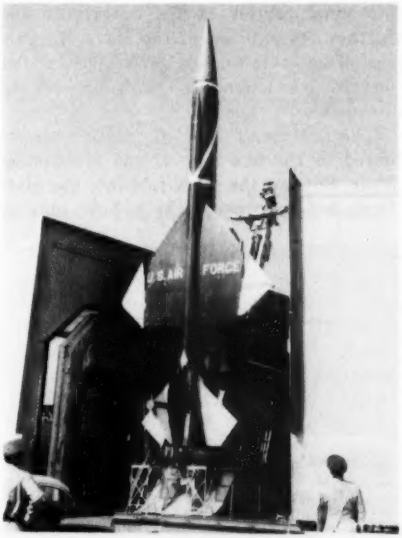
The machine, over 100 feet long, utilizes diesel power to drive electrical generators. The electric power drives motors

Earthmover can handle load of 130 tons

attached to the rim of each of the machine's eight wheels. The two giant self-loading buckets of the device can pick up a 130-ton load of dirt, move it at a speed of about 16 miles an hour, and spread it with an even finish.—News item.

'Bomarc' Test Site

The first *Bomarc* testing and training site has been established on Santa Rosa Island, just off the mainland near Eglin Air Force Base, Florida. The facility is the first in the United States to be manned completely by personnel of the Air Defense Command to train missilemen in the



US Air Force Photograph

***Bomarc* in test site launcher**

firing of the long-range *Bomarc* interceptor missiles. Tests will be directed by a SAGE (semiautomatic ground environment) system under construction in Alabama.—News item.

Nylon Bearings

An oilless suspension system utilizing special nylon bearings is being tested on an *M48A1* tank. These bearings, which operate without grease, are hoped to be a solution for the problem of lubrication of the bogey wheel torsion rods of armored vehicles.—News item.

Carriers Ordered

Four more prototype aluminum *XM-443E1* ¾-ton convertible cargo-personnel carriers have been ordered. Two of the lightweight tactical vehicles will be turned over to the Army and the other two to the Marine Corps. The Army previously ordered one of these vehicles for evaluation test (MR, Jan 1959, p 73). The cargo-personnel carrier is the outgrowth and further development of the *M274 Mechanical Mule*, a ½-ton platform type carrier now in production for the Army and the Marines.

The *XM443E1* has six seats as compared to the one seat of the *Mechanical Mule*. Four of the seats fold into the platform bed to convert the vehicle quickly

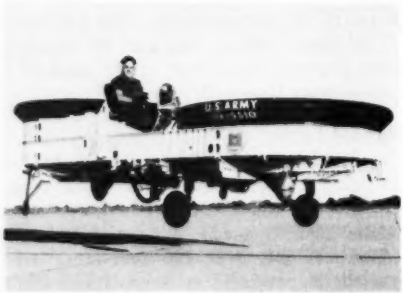
The *XM443E1* cargo-personnel carrier

from a personnel carrier to a ¾-ton truck. The versatile vehicle can travel over virtually any kind of terrain; on the highway it has a top speed of 65 miles an hour. It is powered by a 100-horsepower, air-cooled aluminum engine.—News item.

Wingless Aircraft

The Army's *VZ-8P* wingless research aircraft has been test flown successfully. The vehicle utilizes two small horizontal ducted propellers located within the body to achieve both vertical lift and forward flight. The civilian version of this aircraft, known as the *Sky-Car*, will carry four passengers at speeds up to 150 miles an hour.

Another ducted fan land and air vehicle has been announced. This machine is 23 feet long, 10 feet wide, and 54 inches high.



Army's *VZ-8P* aerial jeep

It has four ducted propellers driven by a six-cylinder engine. It is said to be capable of traveling at speeds of 30 to 60 miles an hour.—News item.

Guided Missile Frigates

Nine guided missile frigates of the as yet unnamed *DLG-16* class have been placed on order. All the vessels will carry *Terrier* surface-to-air missiles, both fore and aft, in addition to antisubmarine warfare equipment. As a class, the new vessels will be about 900 tons heavier than the earlier planned *Coontz* class guided missile frigates, and somewhat lighter than the nuclear-powered frigate in the current construction program.

The new vessels will be 535 feet long and have a 53-foot beam. Original engine plant plans are for steam turbines geared to

twin propeller shafts. The construction of the vessels, however, will permit conversion to nuclear power when a reactor which will fit into a frigate hull has been designed.

The *Coontz* class guided missile frigates will carry guns in forward turret mounts and *Terrier* guided missiles aft. They will displace 4,770 tons and will be capable of a speed of 34 knots.

The nuclear-powered frigate, which carries the official designation of *DLG(N)*, will displace 7,600 tons fully loaded. The 550-foot vessel will have a much greater cruising range at sustained higher speeds than conventionally powered frigates. Two pressurized water reactors will power the vessel's twin propellers. Armament will be *Terrier* missiles in addition to antisubmarine and conventional weapons. Delivery of this ship is planned for January 1962. —News item.

Rocket Ejection Seat

The rocket-powered ejection seat RAPEC (rocket-assisted personnel ejection catapult) is under test for use by Navy

US Navy Photograph

Jet-propelled ejection seat RAPEC

and Marine Corps pilots. The system works in two phases. First, a small rocket blows the pilot's seat out of the aircraft cockpit. Then a second rocket charge projects the seat to a preset altitude where the seat disengages from the pilot and a parachute lowers him to earth. The system is designed to operate at both ground level and high altitudes.—News item.

Missile Test Vessel

The United States Navy's fleet ballistic missile test ship, the *Observation Island* (MR, Mar 1959, p 83), was converted from a fast *Mariner* type cargo ship to conduct

US Navy Photograph

Missile test ship, *Observation Island*

operational tests of launching, fire control, and navigational devices required by the fleet ballistic missile *Polaris*. The *Observation Island*, which displaces 15,000 tons and carries a complement of 130, is equipped with two *Polaris* missile launchers.—News item.

High-Speed Tow Target

The *TDU-9B*, a needle-nose device that looks more like a missile than a tow target, has been developed for use in training aircrews in air-to-air guided missile firing. The 242-pound target, which is 16 feet in length and only eight inches in diameter, is designed for operation at all speeds up to Mach 1.5 and at altitudes up to 65,000 feet. It contains an air-driven generator, a multichannel radio to receive commands from ground stations, an electronic radar tracking beacon, a set of flares to simulate jet exhausts for heat-seeking infrared missiles, a smoke dispenser, and a scoring device that indicates the exact distance of near misses.

The *TDU-9B* will be towed on an extremely long cable to provide aircraft safety. In some cases, a tow cable as much as five miles long will be used.—News item.

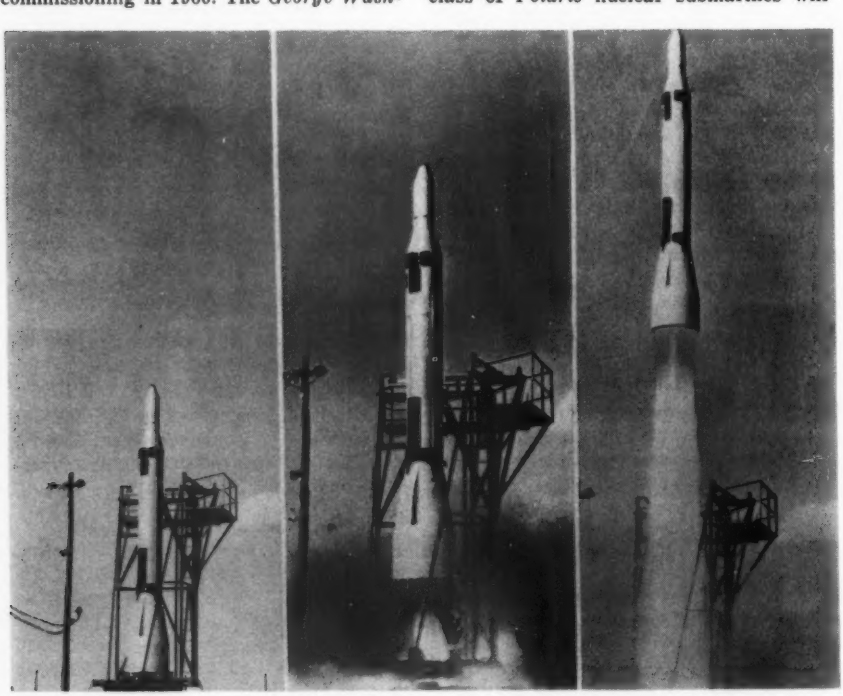
'Polaris' Submarines

The United States Navy's first *Polaris*-armed submarine, the *George Washington*, is to be commissioned this year. Three others are scheduled for launching and commissioning in 1960. The *George Washington* will displace 5,600 tons and carry 16 *Polaris* missiles.

Five of the 5,600-ton class *Polaris* submarines are under construction and will bear the hull numbers *SSB(N)-598* through *602*. A new class of *Polaris*-firing nuclear undersea vessel is planned, and the contract has been issued for the construction of the first of these which will bear the hull number *SSB(N)-608*.

The new class of submarines will be heavier than the *Polaris* submarines currently under construction, and will have a completely new hull design. Those of the *George Washington* class have hulls of the modified *Skipjack* design. The new class of *Polaris* nuclear submarines will be equipped with water-cooled atomic reactors and will carry the same number of missiles as the smaller *Polaris* submarines.

By the end of 1959 the Navy will have nine nuclear-powered submarines in commission; during the next year the number will be raised to 20. The nuclear-powered submarine *Seawolf* has left active service temporarily for a 12- to 15-month overhaul, and will return to service with the fleet in 1960.—News item.



US Navy Photograph

From left to right, sequentive views of launching of *Polaris* test vehicle

Early Warning Blimps

Two of the Navy's new *ZPG-3W* class of nonrigid airships for airborne early warning are undergoing operational tests. The first of these aircraft, which made its initial flight in July 1958, was designed specially for aerodynamic analysis while the second is to be used for extensive testing of on-board electronic equipment. The *ZPG-3W* airships are said to be the largest nonrigid craft ever flown.

The gas envelopes, which contain a large internally mounted radar antenna, have a capacity of approximately 1.5 million cubic feet, about half again as large as the type of lighter-than-air craft now in service. Powerplants for the big airships are two 1,525-horsepower engines mounted on outriggers. They carry a 21-man crew. —News item.

Ammunition Ship Launched

The *Pyro* (*AE 24*) is the fourth of five planned *Suribachi* class ammunition ships to be launched. The other vessels of this class, all identical with the *Pyro*, are the *Suribachi* (*AE 21*), *Mauna Kea* (*AE 22*), and *Nitro* (*AE 23*).

These ships have improved ammunition-handling machinery for rapid replenishment at sea operations. They are able to service ships along both sides simultaneously. The 512-foot vessels are air-conditioned throughout living and working areas. They have a rated speed of 21 knots and a cargo capacity of 7,500 tons.—News item.

Medical Packet

The Phase I Emergency Medical Treatment Unit is a medical packet designed for use in a mass casualty situation where the number of persons injured is out of proportion to the medical resources normally available. The emergency packet, which contains 23 items, will provide medical material for treatment of approximately 100 casualties for about 72 hours.

The packet has nine component cartons: two master packets containing a synthetic plasma expander, and surgical instruments; one fracture pack; two burn packs; and four wound packs. Training in use of the packet, which was developed jointly by the Army, Navy, and Air Force, will be carried out in all three services.—Official release.

Reorganization

The Army has announced plans to reorganize its infantry and armored divisions and armored cavalry regiments to increase battle efficiency. The changes do not reflect any departure from the basic pentomic concept which is to be retained. The total strength of present units also remains unchanged.

The infantry divisions are to have five direct support artillery battalions and a general support battalion within the division artillery structure. Other changes include an increase from four to five rifle companies and the addition of a combat support company in each battle group. The 4.2-inch Field Artillery Mortar Battery has been eliminated.

The new combat support company will have an infantry heavy mortar platoon and reconnaissance, engineer, and assault gun platoons. One rifle platoon is to be deleted from each rifle company. The new rifle company will have three rifle platoons and a weapons platoon.

In the armored division, the reconnaissance companies of the reconnaissance battalions have been standardized with similar companies in the infantry divisions.

The armored cavalry regiments, battalions, and companies are to be redesignated as groups, squadrons, and troops. Each group will be made up of three standardized squadrons. Each squadron will consist of a headquarters and headquarters troop, three reconnaissance troops, a medium tank company, and a 105-mm howitzer battery.—News item.

GREAT BRITAIN

New Uniforms

The British Army has 3,000 soldiers testing new "walking out" uniforms. There are four designs of this type uniform which are planned to bridge the gap between the British soldiers' battle dress and blue uniforms. All four are khaki, based on the British officers' service dress uniform, each varying slightly in color and styling of pockets. If one of the designs is adopted, it is expected that issue will be made in 1960. Unlike dress blues, which are worn only by noncommissioned officers, the new uniform will be worn by all enlisted men.

Also under test are a new combat uniform, a Highland tunic, a raincoat, and a new uniform for the Women's Royal Army Corps and the Royal Army Nursing Corps.

The new combat uniform or battle dress is more streamlined than previous versions without hip or knee pockets. The Highland pattern tunic is light khaki designed to be worn with the kilt and, if accepted, will be prescribed for wear in the Highland regiments. The proposed raincoat is a civilian style, belted, with side slit pockets. It may be issued to replace the poncho that has served the British soldier as an all-purpose raincoat.

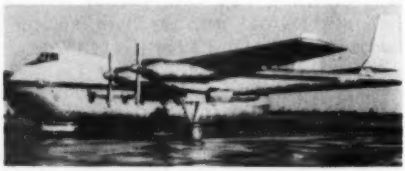
The Women's Royal Army Corps uniform is green worsted with shoulder straps piped in dark green. The skirt is pleated and the coat has no breast pockets or belt. It will be worn with a white shirt, a bottle green tie, and high heel shoes. The nurses uniform is of the same style, but is grey worsted with shoulder straps piped in scarlet.—News item.

Twin-Jet Fighter

The *P.1B Lightning* all-weather interceptor, now in full-scale production for the Royal Air Force, is powered by two *Avon* turbojet engines mounted one above the other within the fuselage. The two engines utilize a common air intake in the nose of the plane and are staggered with the lower engine well ahead of the upper. With reheat the engines develop a total of 25,500 pounds of thrust. The swept-wing fighter has flown at a speed of 1,280 miles an hour with full war load in a test flight. The *Lightning* is armed with two 30-mm *Aden* cannon in the fuselage, one on each side of the cockpit, and two *Firestreak* air-to-air missiles mounted on pylons projecting laterally from the fuselage. Rocket, gun, or camera pods can be substituted for the missiles.—News item.

Turboprop Transport

The *Argosy AW.650* series of turboprop aircraft consists of a range of related civilian and military types designed for passenger, freight, or mixed transport. The basic design is somewhat similar in conformation to the United States *C-119 Packet*, with the fuselage suspended beneath the wing and the tail surfaces supported by twin booms. The *Argosy* will be powered by four *Dart Mk.526* turboprop engines which provide 1,910 horsepower each to the propellers and also have a jet thrust of 505 pounds. An alternate powerpack comprises two *Tyne* engines of about 5,000 pounds thrust each.



***Argosy AW.650* turboprop freighter**

Both ends of the fuselage open for quick loading or unloading; in the military version a rear ramp is provided for heavy equipment loading or for paradrop operations. In the passenger version, the aircraft can accommodate 83 passengers or 14 tons of freight, with the payload considerably increased for short hauls. Maximum speed will be 296 miles an hour and maximum range 2,800 miles.—News item.

Portable Ferryboat

Metal tank-shape construction units, called *Uniflote*, can be transported separately to the scene of their use and assembled to form ferries for river crossing operations or assembled into floating docks. The basic *Uniflote* unit is a steel pontoon 17 feet four inches long, eight feet wide, four feet deep, and weighs about three

Helicopter lands on *Uniflote* ferry

tons. Couplers at the sides and ends permit the connecting of two or more *Uniflote* units for any desired size or shape. When used as ferries, the *Uniflote* raft can be powered by outboard motors.—News item.

'Rotodyne' Record

The VTOL transport aircraft *Rotodyne* (MR, Feb 1958, p 70 and Sep 1958, p 84)

***Rotodyne* with vertical tail surfaces**

has established the world's speed record in the convertiplane category by completing a 100-kilometer closed-circuit course at a record speed of over 190 miles an hour. This exceeds the closed-circuit record for helicopters by 49 miles an hour and the absolute helicopter speed record by 29 miles an hour. The *Rotodyne*, which can carry 40 to 48 passengers or about 15,000 pounds of freight, first flew in late 1957, and has made more than 150 flights since then. The tail fins of the big VTOL aircraft which sloped outward on earlier models have been made vertical on more recent developments.—News item.

Engine Test

The *Viper ASV.3*, a "short-life" turbojet engine designed as a powerplant for the Australian *Jindivik* target drone aircraft (MR, Jun 1958, p 74), has completed testing in an underwing mounting on a *Canberra* bomber. This engine produces 1,640 pounds of thrust.

Other versions of the *Viper*, the *ASV.8* and the *ASV.11*, are slated for similar testing. These two "long-life" *Vipers* are rated respectively at 1,750 and 2,450 pounds of thrust.—News item.

Plans for 'Dreadnought'

The *Dreadnought*, Great Britain's first nuclear submarine, will displace 2,000 tons standard and 3,000 tons submerged. The 300-foot-long vessel, which is to have the *Albacore* hull design similar to that of the United States submarine *Skipjack*, will cost between 56 and 70 million dollars.

Carrying the pennant number *S 80*, the *Dreadnought* will be manned by a crew of about 80 men and is expected to have a speed of about 30 knots. It has been announced that the *Dreadnought* will not be armed with ballistic missiles.—News item.

POLAND

Rocket Announced

The first Polish-made rocket to be reported is a small research vehicle about 32 inches long and two and a half inches in diameter. Successful launchings of this rocket have been conducted.—News item.

FRANCE

Transport Helicopter

The *SE.3200* is a transport type helicopter designed for both military and civilian uses. The big aircraft, which is equipped with three *Turbomeca* free turbine engines driving a single main rotor,

Artist's conception of the *SE.3200*

is planned for early flight test. It is said to be designed for great endurance and easy maintenance. Bench testing of the power unit of the *SE.3200* was started in July 1958.—News item.

Nuclear Submarine Progress

It is planned that France's first nuclear-powered submarine will be launched within the next two years. The vessel, which is expected to have the same performance characteristics as the United States submarines *Nautilus* and *Seawolf*, will displace 4,000 tons on the surface and 5,000 tons submerged.—News item.

EGYPT

Dredge Leased

The largest oceangoing dredge in the world, the United States Army Engineers' *Essayons*, has been leased by the United Arab Republic for six months' work on the Mediterranean approaches to the Suez Canal. The *Essayons*, which works like a giant vacuum cleaner scooping up silt from the ocean floor, will be used to widen the canal's entrance and deepen it from 39 to about 45 feet.

The work is part of the program to allow passage of vessels with a 37-foot draft by mid-1960. The big dredge, which is designed for 24-hour a day operation for weeks at a time, can handle one million cubic yards of silt a month under favorable operating conditions. It carries a crew of 125, and was leased for about $8,000 per day of operation.—News item.

SPAIN

United States Naval Bases

The United States Navy has a new fleet supply base operating at Cartagena on the Mediterranean coast of Spain. The new naval facility, constructed at a cost of 10 million dollars, was built under the aid-for-bases agreement between the United States and Spain. Cartagena also is a major base for the Spanish Navy.

United States naval antisubmarine bombers already are operating from the giant air-navy base on Rota (MR, May 1957, p 72) at the Atlantic entrance to the Strait of Gibraltar. When completed, the harbor facilities at Rota will accommodate two *Forrestal* class aircraft carriers. A total of 3,000 naval personnel are to be stationed there by next year. Present US naval strength at the big base is 1,800. —News item.

COMMUNIST CHINA

Additional Duties

Officers of the Communist Chinese Army are being sent to communes to assist in reorganizing and consolidating these basic units of Chinese Communist existence. Before going to the communes, of which China is estimated to have about 26,000, the officers are given a short training course. In the communes, they will serve as ordinary workers under the guidance of the local Communist party authorities. —News item.

Military Training

Military training was given to 30 million Chinese during 1958. Four million of those trained received experience in firing live ammunition.—News item.

AUSTRALIA

'Sidewinder' Adopted

The *Avon-Sabre* jet fighters of the Australian Air Force are to be armed with United States *Sidewinder* missiles. An order has been placed for equipment necessary to fit all the aircraft of two squadrons with the missile. The infrared-guided, heat-seeking *Sidewinder* is expected to increase the operational effectiveness of the jet fighters greatly.

At present the *Avon-Sabre*, an Australian-built version of the United States *F-86F* equipped with the more powerful *Avon 20* turbojet engine, is armed with two *Aden* 30-mm cannon for air-to-air combat, and can carry rockets and bombs for ground attack. It has a maximum speed of 700 miles an hour and an operational ceiling of over 45,000 feet.—News item.

Prefabricated Frigates

The *Yarra*, first of four planned prefabricated frigates similar to the British *Whitby* class vessels, has been launched. These warships, 370 feet long and displacing 2,800 tons fully loaded, are classed officially as antisubmarine frigates although they are armed more like destroyers. They will have a twin 4.5-inch gun mount, two 3-barrel *Limbo* antisubmarine mortars, and two double and eight single torpedo tubes. They will be capable of a speed of 30 knots.—News item.

WEST GERMANY

Train With Rockets

Training of West German soldiers in handling *Honest John* rockets has begun. Two launching ramps for the short-range surface-to-surface missile have been set up in the Eifel mountains training area where about 200 men will receive nine months of training. Twenty-four of the rockets, equipped with dummy cement warheads, have been purchased from the United States for training purposes.—News item.

USSR

Map Completed

The Soviet Union is reported to have completed a large-scale topographical map of her entire land surface. The map, which is said to consist of 10,000 sheets, is on a scale of 1:100,000. Aerial photography is reported to have been used extensively in the preparation of the map.—News item.

Delta-Wing Bomber

A supersonic delta-wing bomber with the code name of *Bounder* has been reported. It is said to be about 75 feet in wingspread, 200 feet long, and have a speed in the vicinity of Mach 2. The *Bounder* has turbojet engines in its wing roots with auxiliary engines in pods mounted on the sides of the fuselage.—News item.

EAST GERMANY

Air Force Expansion

The East German Air Force at present has about 10,800 men, of whom 8,000 are in fighter squadrons. The air force presently is equipped with only 70 *MiG-15* fighter aircraft, but rapid expansion of the air force is expected since the East German aircraft industry plans to go into production of Soviet type aircraft soon.

The center of the aircraft industry is located at Pirna, and the entire industry encompasses eight different plants employing 21,000 people. New airports of the air force generally are grass landing strips about 3,500 feet in length, protected by antiaircraft artillery units.—News item.

Military Academy

The recently inaugurated East German military academy at Dresden is expected to provide the East German Army with a professionally trained, reliably Communist officer corps. In the past, junior officers for the army came from the ranks of youth organizations and from the police. The East German Army has six divisions and a total strength of 110,000 men.—News item.

MILITARY DIGESTS

Forethoughts

Translated and digested by the MILITARY REVIEW from an article by Major A. Bach, in "Revue Militaire Suisse" (Switzerland) May 1958.

ONE of the favorite gambits of a certain school of writers is to take their contemporary readers forward in *time*, to look back, as it were, on the history of today and the immediate future. But there is one thing—and the only thing that counts in the long run—that such anticipatory writing cannot tell us. This is whether man will continue to master his scientific discoveries or if he will, like "The Sorcerer's Apprentice," be mastered by them.

On the military level it is especially risky to attempt to predict the future. Not only has the development of arms and tactical doctrine taken place at an accelerated rate for the past half century, but the political pattern itself is far from being as stable as it was only a few decades ago. Changes in alliances and spectacular surprise actions undoubtedly will be an integral part of the action occurring in the first few hours of a future armed conflict. These unforeseeable events, likely to favor either the attacker or the attacked, can frustrate reasoning and spoil all previous reckoning.

But certainly one advantage of a tentative look into the future might be to allow us to bring the concerns of western Europe into sharper focus. The inhabitants of Europe, "that small foreland of Asia," for centuries in the center of the world stage and most often concomitantly producers and chief performers in civilization's most dramatic events, must look forward to a role of diminishing importance. Looking ahead at the aspects a future war could assume, it is doubtful if continental Europe again will furnish the decisive battlefields for world supremacy. Even though her ancient battlefields become bloodstained once more, it is quite likely that the issue already will have been determined elsewhere, and the European battles nothing more than one action among many.

In the analysis of world political expressions, considerable importance usually is attributed to the declarations of high officials. Man has been given language to disguise his thoughts, as the saying goes, but there are certain historical constants and geographical, economical, and military realities which always prevail over such declarations, no matter how honest they may be. To detect the underlying forces which imprint their effects on the events of tomorrow, one must uncover these constants and realities.

The Constant Threat

For instance, as convincing as the desire of the USSR to get along with the capitalistic countries might appear to some, there is other evidence that Russia is a carrier of the germs of future conflict. Unforeseen circumstances, or what in a

pinch might be called a historical accident, may be enough to make this infection virulent. This tremendous empire, succumbing to the temptation to break out of suffocating encirclement, would make every effort to smash America—the only real obstacle to the Communist dream of world hegemony. Later we will discuss possible reasons why she might not resort to such violence.

At the beginning of the century, Mackinder stated that a nation in simultaneous control of the land and sea would be mistress of the world. Russia fulfills all conditions required to assume supremacy on the ground, at least as far as Europe is concerned. Her forces considerably exceed those of her combined potential enemies. There are few obstacles to prevent her from hurling herself across Europe to the Atlantic. However, it is not quite the same at sea. Soviet power is only average. She has been kept away from the western open seas by a self-defense reflex. The abortive attempt to impose communism on Greece, the presence of United States naval forces in the Mediterranean Sea, or, perhaps, simply the consciousness that the fruit was still not ripe seemed to have dissuaded Russia, thus far, from seizing key positions on the Mediterranean.

Will she always let her ambitions be thwarted? Will she seek compensation in the air for her miscalculations at sea? As far away as they may be, Syria and Egypt are outposts which she could plan to join. In such a case, a campaign such as the Anglo-French intervention in Suez or some other kind of police action would furnish a handy pretext. From this a general conflict could arise.

To imagine what will happen afterward, is, to say the least, hazardous.

China

It would be interesting to know whether Russia has secured China's neutrality, or just the opposite—her active complicity. Being a strictly continental power for the present, the Chinese Empire possesses neither a navy nor an air force deserving of these names. Thus would she be capable of rendering the same services to her partner Russia as Japan rendered to Germany by tying up a large part of the United States forces in the Pacific? This seems doubtful.

However, her collaboration apparently is useful even if limited to the area south of the Himalaya mountain barrier. By inciting her to join the battle and giving her free rein in the south and southeast of Asia, Russia would be assigning her a natural expansion zone. Moreover, Russia thus would forestall an eventual competition with a neighbor whose resources have not yet been tapped by any effort to wage war.

Conflict

It will not be easy for the USSR to compel America to comply with her will. America's means of defense are considerable. Her size and her position make her little vulnerable, even in this age in which aviation has a very large autonomy, and in which guided missiles furrow the sky. It is very unlikely that a decisive victory can be won over the United States in Europe. Now, the mere existence of this nation, whose military potential and whose will to resist would have been little affected by a disaster on the European Continent, means, with all certainty for her adversary, that the conflict will be long and its outcome doubtful. Consequently, all efforts of the aggressor from the start will be blows that are intended to make the United States succumb before she could deploy her considerable means.

Without risking an error, one can affirm that a conflict started by Russia will begin with bombing raids on the United States and, probably, Great Britain. The purpose of these bombardments would be to destroy part of the industrial and military potential of these nations, but also, and above all, to crush their will to resist as quickly as possible. The large industrial

complexes, ports, communication centers, and the Panama Canal will be the most probable targets. Airplanes with long radius of action, missiles shot from the Continent or from submarines hiding near the coast, and carriers of nuclear charges could provoke unprecedented destruction.

Simultaneously, other actions would be directed on the bases with which NATO strategy has surrounded the Communist bloc. These actions would attempt to prevent the reprisals the allies hold in reserve. Airborne troops could play a most important role in the course of these operations. Furthermore, the partition of the potential Euro-African battlefield should not be ignored. This can be achieved by a series of actions aimed at Gibraltar, the Danish straits of Skagerrak and Kattegat, Suez, and perhaps Aden. Minefields would add efficiently to the effects of bombardments and airborne landings.

Can It Be Done?

Before going on to discuss the consequences this first shock might have, let us consider the question of whether the USSR actually possesses or, in the years to come, will possess the means needed to realize such a far-reaching undertaking. The circular arrangement of the free world nations around the Communist bloc forces the latter to tremendous, divergent actions. For fear of seeing the initiative of the operations lost at the start, the Soviet staffs inevitably would be forced to make an extraordinary initial effort. Without decisive success from the beginning of the conflict how could they evade the menace of a counteraction by the Western Powers and an endless and exhausting war? Without a Pearl Harbor on a worldwide scale how could they nip the reprisals in the bud which the NATO air fleet poses for the Red world? Even if they possess the means to put on such a tremendous effort, could they be sure of its outcome? Each succeeding armed conflict once more has demonstrated the importance of imponderable factors. Operations, even when carried out with skill, are never free from failures due to the combined effects of both material deficiencies and human mistakes.

Terrestrial Conquest

Terrestrial conquest would be the objective of the second phase of this conflict. There are serious-minded people who are actually estimating that a war waged with nuclear weapons could not last more than a few days. It remains to be seen if the impact of these arms and the shock into which their use would plunge the free world would suffice to convince Western leaders that they could not continue the fight. If this does not happen, the pretenders to world hegemony will have to resort to terrestrial occupation. One can visualize such occupation to be accompanied by further bombardment and a carefully stirred up reactivation of Communist destructive activity and terror in the countries to be occupied.

A narrow thrust across Europe in the direction of the English Channel and Spain would not yield the desired results. Immobilized in a corridor of variable width, the Red forces whose leading columns would have reached Antwerp, Cadiz, and Marseilles would present a still higher vulnerability than the German forces to the counterattack from the sea in 1944.

The north protection of the Continent requires the seizure of the Scandinavian Peninsula. In the south the Mediterranean, even cleared of the fleets and bases of the allies, offers actually less security than the prophylactic zone of the Sahara. To gain complete control of the Continent, will one see Rommel's campaign repeated, this time in the other direction, starting out from the Middle East?

Finally, will England be the next leap? Nobody can tell whether America, in view of the extent of the catastrophe, will succumb, or, once again, launch her amphibious forces to rescue the Continent. The Russian armies will be stretched to the

extreme limits of their strength, and hit in their communication system by aircraft and missiles with which they literally will be showered. Irritated by the endless fights against guerrillas, the Russian armies perhaps will be forced to withdraw from the European "dead end street," practicing fluid defense which, eventually, will bring them back to their point of origin.

The Imponderables

The future, as imagined above, looks gloomy for Europe. In fact, visualizing the operations as they could happen, we systematically put things at the worst. So, we have given little consideration to the 25 or 30 divisions the NATO member countries could dispose against the Soviet dash across Europe. The neutral states also are not without resources. We have not considered the effect of an air and missile force, ready to drop their charges on the USSR at the first hour of a conflict. We neglected a possible slowdown of the Red operations due to uprisings of certain Communist satellites. Finally, we assumed that the blitz, staged with some new formula, would take place without failures, following a previously established plan. All these neglected factors, will, when acting together, make the undertaking of military domination of the world even more difficult.

On the other hand, we considered that the United States, and perhaps Great Britain, would preserve their unbroken will to continue the war.

Is it necessary to go into more detail? Our entire setup rests on too many conjectures to assume more than a merely speculative interest. But this does not mean that a future conflict will avoid completely the course we have ascribed to it. Even if the outcome of the operations depends on factors of unforeseeable nature, their course will be determined by logic in accord with the pursued goal and the available means. It is from this angle, and from this angle only, that the future can be anticipated.

Final Questions

Considering the dimensions of a future general conflict and the huge efforts it would require, can a nation, even if provided with an overwhelming demographic and industrial potential, still aspire to world hegemony by brute force of arms? A complete strategic surprise alone, if it completely convinces the opponent of the inevitable outcome of the war, will convince him to surrender promptly. But from the moment the conflict is perpetrated, the load imposed on the continental power increases and the chances for success diminish. Can the formation of the political and military setup calculated to realize this surprise really escape the attention of the adversary?

Aside from the case in which this power would be carried away by an outburst of passions clouding consciousness of the dangers involved, is she not more likely to attempt to bring about in some other way, the decisions aimed at extensive political development?

Is not a policy of infiltration, pacific penetration, and aid offered liberally to nations "in growing pains," in all respects more rewarding and less uncertain than a military action which would alienate valuable sympathies?

Finally, are not the military efforts of the Soviets aimed at giving the statesmen an instrument of political intimidation which is far more efficient when kept in reserve rather than ventured in hazardous conquest?

The answers to these questions are quite clear if it is considered that the Soviet leaders are the principal beneficiaries, in truth, the only beneficiaries, of the Bolshevik Revolution.

Europe in Danger

Digested by the MILITARY REVIEW from an article by
Urs Schwarz in "Swiss Review of World Affairs" April 1958.

NO ONE can seriously deny that the situation left behind in Central Europe by the Second World War—the partition of Germany, the uncertainty of the eastern boundary, and the presence of Russian, American, and British troops—is a source of international tension. But many observers, particularly in Germany and Great Britain, have been too hasty in concluding that the mere withdrawal of troops from the critical area would suffice to lessen world tension. An unprejudiced examination of the military situation alone, quite aside from all considerations of the numerous political problems involved, leads one to an entirely different conclusion.

The Situation

A survey of the basic situation today shows that the Soviet Union maintains 22 divisions, mostly mechanized, in the territory she occupies in Central and Eastern Germany. There are 65 divisions stationed in Poland and in the western sections of the Soviet Union. These troops are supported by a powerful air force, backed by a system of well-developed airbases. Air and ground forces are armed with nuclear weapons of every kind. Pitted against these dispositions is the NATO "shield" which is made up of the approximately 15 divisions formed by American, British, and German troops and the units contributed by other members of NATO.

Also part of the "shield" are the special American units with atomic weapons, and a strong tactical air force which is supported by a network of modern airbases. As everyone knows, the purpose of this "shield" is to establish a clear line of demarcation between the territories of the nations included in the North Atlantic Pact, and the superior military power of the Communist world. Any kind of Communist infiltration into an area beyond this boundary could not take place "gradually," "by mistake," or on any pretext. It would have to take place in the form of a clearly planned attack, an overt act of aggression, which immediately would cause the strategic air force of the NATO allies to deal the opponent a crippling blow in retaliation—and so also would bring on the nuclear world war. In its function as a warning and a deterrent, the NATO "shield" has fully served its purpose so far; peace has been preserved.

It is a fact, however, that even though experience has proved it to be right, a number of people would see this concept replaced by another one at all costs. The forces which are urging a change are well-known: the Soviet Union would very much like to regain the freedom of movement and the initiative she has lost in Europe; to many Western Europeans the efforts made to achieve military security appear too great; many well-meaning people are unhappy to think that their safety depends primarily on the threat of using the most terrible weapons known to man; many Germans believe that any change in the present situation would be for the better as far as the reunification of Germany is concerned. Among all these various interested parties, the Soviet Union would be the real victor if she managed to obtain her objective. The others—such as George Kennan—however, would deliberately exchange the present situation for a state of uncertainty and dependence on Moscow.

The Alternative

The alternative that is to replace the *status quo* has always been specified quite openly by the Soviet Union: the dissolu-

tion of NATO, the withdrawal of American and British troops from the Continent, and the elimination of nuclear weapons. In view of the West's resistance to all these extreme demands, a slightly more subtle method of procedure was evolved and set into operation in the last General Assembly of the United Nations. It took the form of the "Rapacki Plan." The latest, more elaborate version of this plan provides for the establishment of a zone, including Poland, Czechoslovakia, and Germany, from which atomic weapons would be barred. The governments of Poland, Czechoslovakia, and the German Federal Republic, as well as the authorities in the Soviet-occupied zone of Germany, would pledge themselves, in an agreement with the major powers and among themselves, to refrain from producing or maintaining nuclear weapons on their territory and to admit no foreign troops armed with nuclear weapons. In their acceptance of this plan, the major powers would promise not to use any nuclear weapons on objectives within this "neutralized" area.

What does this plan mean in military terms? It would turn Central Europe into a parade ground for conventional armies. Since neither the United States nor Britain have, at their command, armies large enough to hold the field with traditional weapons, and since their armies would be able to defend themselves only with the help of the additional firepower of nuclear weapons, both nations would be forced to withdraw their troops from these areas immediately. It goes without saying that such a withdrawal would not come to a halt at the borders of France. For how could it be justified politically that among the nations allied in NATO some harbor foreign troops while others do not?

To create a counterweight to the Soviet zone "People's Police" and the Polish and Czechoslovakian Armies alone, Germany would have to maintain an army far larger and far more costly than the 12 divisions which she is to place at NATO's disposal some day. The link between the armies standing in the "safety zone" and the worldwide alliance and security systems would be severed. The possibility of one of those "accidental" conflicts that might touch off another world war after all thus would become more real again. In view of the importance of Central Europe, a limited war of the kind fought in Korea is out of the question. In reality, the commitments stipulated in the Rapacki Plan would break down the moment peace was disturbed within the area guaranteed by it.

Local Agreements

How can anyone even imagine that an agreement of the major powers to forego the use of nuclear weapons within a specified area, and the area most vital to them at that, actually could be concluded, when up to this day all efforts made in the direction of disarmament have proved of no avail? The aim to pursue is a general reduction of armaments. In view of the range of modern weapons, and particularly of future weapons, local agreements would be useless, and indeed dangerous, because they would stand in the way of the efforts made to find worldwide solutions. From a purely technical point of view Germany, Poland, and Czechoslovakia would not stand to gain more security by the proposed agreements. For whether two opponents fight each other with intermediate range missiles from beyond their borders or from their own territory, certainly makes no difference in regard to the effects of radioactivity.

No one can escape *alone* from the dangers of modern weapons, whose effect is often beyond control. Even a truly neutral country like Switzerland is fully aware of this fact. However, to secure Central Europe against such dangers actually is not the object of the authors of the Rapacki Plan. What they are concerned with exclusively is the destruction of NATO, the departure of the American

and British troops from the European Continent, and the creation of a general state of insecurity.

Its lack of military realism and its political hypocrisy already have condemned the Rapacki Plan. But the rejection of this and similar proposals does not mean that the present balance of armaments and atomic "deterrence" should be allowed to continue. The formula which might point the way to a better solution—in case the Soviet Union is sincerely interested in a relaxation of tension—was set forth in the instructions given the foreign ministers for the Geneva "summit" Conference on 24 July 1955. It reads:

A security pact for Europa or for a part of Europe . . . limitation, control, and inspection in regard to armed forces and armaments; establishment between East and West of a zone in which the disposition of armed forces will be subject to mutual agreement; the heads of government, recognizing their common responsibility for the settlement of the German problem and the reunification of Germany, have agreed that the settlement of the question and the reunification of Germany by means of free elections shall be carried out in conformity with the national interests of the German people and the interests of European security.

The Solution

Without the unrealistic Rapacki Plan and without even a summit conference but by simply continuing along the course adopted by the Geneva Conference, a solution to the European problems might be attempted. In this process, of course, the present conditions of military policy and the precarious but nevertheless effective guarantees for peace they have afforded to date should not be touched or changed until a new, durable, and comprehensive security in the spirit of the Geneva resolutions has been established.

An Inquiry Regarding Modern War

Translated and digested by the MILITARY REVIEW from an article by Lieutenant General Zeno Estillac Leal in "Mensário de Cultura Militar" (Brazil) September-October 1958.

IN REPLY to a series of questions regarding atomic war which were addressed to him by a member of the press, His Excellency Lieutenant General Zeno Estillac Leal, Brazilian Army Chief of Staff, prepared the following answers:

Do you believe that atomic weapons will prevail in a future armed conflict?

It is true that there may be some conflicts of secondary importance which will not involve the interest of the major powers. These will, obviously, be less and less frequent in view of the probable intervention by the United Nations (which in such cases, certainly will be very effective) and also by the respective local systems of collective security. These measures, if not capable of completely averting the conflict, at least will keep it from gaining force and spreading. These armed conflicts will assume the "conventional," sometimes called "classic," form with a reasonable probability of not becoming a nuclear war.

With the exception of the above cases, everything makes us believe that atomic and nuclear weapons will be used in future conflicts and, even though not actually employed (as in the case of the so-called limited wars), their tremendous potential or "deterrent effect" will be felt. This will be a very decisive element in the limitation of any war—if such limitation is possible in view of the national political interests and objectives at stake.

The constant threat of the possible use of these weapons by the enemy and the temptation we have of using them to compensate for serious reverses or to secure certain important successes will constitute, in any case, the extremes of a terrible dilemma which will revolutionize completely the concept and conduct of war operations now and in the future.

Generally speaking, therefore, armed conflicts even though not "atomic" will take place under "atomic conditions." Such situations will become worse when the atomic monopoly begins to disappear and other world powers ready themselves for the production and employment of such weapons.

The increasingly serious threat of mass destruction, part of the concept of atomic war itself and no less implicit in limited wars, explains the frequent recourse to the so-called subversive, unconventional, or social-revolutionary war so popular with the Communist bloc. This is not only one of the means of the "war by proxy" in which the principal parties remain behind the stage, but a very special war which employs its own highly profitable tactics and techniques—sabotage, guerrilla action, assassinations, partisan warfare, irregular forces, and "volunteers." In this camouflaged type of aggression, whether indirect or direct, the ideological factor is seen very clearly. In such wars atomic weapons cannot be advantageously employed unless through their deterrent power against third parties, or with a view to keeping the subversive action from developing into a major war.

In case of a major war do you believe that atomic weapons and other such devices will be employed indiscriminately and without limitations, or do you think that they more probably will be employed only in tactical operations?

The tactical employment of atomic weapons and other devices is being viewed with increasing interest by the major powers and even by those who count on having these weapons supplied by those who have the monopoly for their mass production.

Undoubtedly, the organization of larger ground units capable of employing these weapons, such as the new pentomic division of the United States, makes it possible to compensate for a lack of manpower. Thus they can face, with certain advantages, the flooding mass attacks of those countries with tremendous manpower reserves.

On the other hand it is becoming increasingly difficult—and it will be more so under the pressing conditions of actual war—to determine definite boundaries between the tactical and the strategical employment of these mass destruction weapons. This will still be possible, however, in limited or local wars, especially in the so-called wars by proxy. With regard to a major war in which the atomic powers become openly involved, the effective application of any techniques of limitation of the armed conflict, either by defining the area of operations through the selection of targets or by ruling on the weapons which will be employed, seems extremely improbable.

In certain cases we might admit that the interests of one or the other of the principal belligerents possibly could limit the war if evaluated in the light of possible retaliation and of the real value of the political objectives in question. But our opinion is that the tendency of war, in the future as in the past, is to become total through the indiscriminate employment of all available means—without any humanitarian scruples or any feeling of sentimentality—whenever really vital interests to both sides are at stake, and particularly when it involves the problem of survival of nations.

Also, other countries besides the United States and the USSR soon will become atomic powers. Once the monopoly held by these two is broken, the possibilities of an atomic war becomes greater than ever.

Do you think that any country today holds a superiority with regard to atomic weapons which would enable that country to employ them to decide a war as was done by the United States against Japan in the last world conflict?

At the moment we are in a position of almost parity between the West and East. We do not have, however, on either side such a degree of superiority as would permit an absolutely decisive employment of atomic and nuclear weapons. Even after an atomic exchange, and in spite of the extraordinary advantages which the aggressor would have in view of his initiative in the attack, both blocs still would have an appreciable residual capacity to continue the war the outcome of which would probably be favorable to the one that held the greater economic power.

Furthermore, even in World War II atomic bombing did not represent the truly deciding factor of the war between the Western Allies and Japan. As we know, the Japanese Empire was already vanquished and had already initiated peace negotiations when the bombs were dropped in Hiroshima and Nagasaki.

Do you believe that Brazil should prepare herself for the atomic war? If so, in what manner and in which degree, considering the country's material resources on one side and the risks involved because of its politico-geographical position?

Brazil should undoubtedly prepare herself for a war "under atomic conditions" in which we may see ourselves involved, especially in operations outside the continent. We cannot feel completely at ease regarding the possibility of action against our coasts and principal centers by enemy elements having atomic weapons and other devices. This increases the importance of the civil defense measures.

On the other hand, the degree to which we should prepare ourselves for an atomic war will result, naturally, from the increase in the scientific, technological, and industrial development of the nation.

Each country should equip its armed forces with the most modern and efficient equipment necessary to any military action for the preservation of national objectives. However, the limitations of the national economy always will condition the process of preparation for security.

A great portion of the preparation of officers and, to a certain extent, the troops, can be carried out with appreciable and profitable results, even though we do not have all the latest and most efficient weapons.

The army would not be performing its mission if it did not prepare itself, without delay, for all forms of war which we admit to be possible: the *classical war* still fought with conventional weapons, the *atomic war* and *war under atomic conditions*, and finally, the *subversive* or *unconventional war*.

Preparations for wars that are so diverse in nature, and the organization of a military instrument capable of facing all of them, are problems of the most serious nature. The difficulties involved in arriving at a solution are self-evident.

Desantniki

Thoughts on Constructive Thinking as Opposed to Drillbook Methods in Parachute Operations

Digested by the MILITARY REVIEW from "The Royal Engineers Journal" (Great Britain) June 1958.

Reprinted from an article by Lieutenant Colonel Kolgushkin in "Krasnaya Zvezda" (Red Star) (USSR). Translation and comments by Perevodchik.

THE maneuver defensive position has been penetrated. The attackers strengthen the assault and cut off the "enemy" fire positions which have survived. The pursuit is organized and an attempt made to break through to the river as quickly as possible without giving the "enemy" a chance to construct a new defensive position on it. But the "enemy," on his part, is not asleep. He brings his reserves up to the river, and with the help of heavy engineering equipment hurriedly constructs trenches and fire positions on the northern bank of the river.

The attacking forces decide to deliver an atomic strike on the "enemy" concentration area and to drop a parachute force to capture crossings and cut the withdrawal routes of the retreating "enemy" subunits.[1]

The plan is put into action and an atomic explosion simulated on the northern bank of the river.

The attacking planes soon appear overhead. They achieve local air superiority and bomb the antiaircraft guns which could oppose the parachute drop. The transport aircraft follow and the parachute force—together with heavy weapons, antitank guns, and ammunition—is dropped in the area of the atomic explosion.

At the same time the "enemy" has taken steps to counter the parachute threat. The area of the atomic explosion has given the commander of the defending subunit, Major Zayetsev, an idea as to where the drop will take place. This officer, using his initiative, immediately begins to move his subunits toward the threatened area.

When the parachute troops appear in the sky the defenders' tanks are already approaching the drop zone and, deploying into battle formation, attack the parachute force as it lands.

The parachutists are in a precarious position. They immediately bring their antitank guns into action and use grenades[2] to beat off the tank attack. The subunits under the command of officers[3] Reshetov and Kozlov and the gun detachment under Sergeant Pershin in particular act with great vigor. Immediately after landing, the parachutists seek out the packs containing their heavy weapons, take up their fire position on the drop zone, and open fire before the "enemy." But their brave action would not have met with success if they had not been carefully and correctly organized and trained to cooperate intimately with the air force and artillery.

By the Book

Why did it happen that the landing force was threatened with destruction immediately after the drop? We must examine some general factors. Small parachute forces are employed tactically to capture and hold bridgeheads in order to disrupt the cohesion of the enemy's defense, to help the operations of other troops in the main land battle, and to carry out a series of operations aimed at

[1] All units smaller than and including battalions are called subunits in the Soviet Army. The Soviet regiment is the only *unit* as such. Larger units are called formations as in the British Army.

[2] The word "grenade" is not clear as it can mean rocket launcher bombs, antitank grenades, or a cluster of several hand grenades which are sometimes used against tanks.—Translator.

[3] The Russians, in written articles frequently refer to officers up to battalion commander inclusive as officer "so and so" rather than by rank.—Translator.

disorganizing the enemy's command and control of his own troops.

A parachute drop to form a bridgehead immediately after an atomic explosion is an operation generally recommended "by the book." But if this is done as a matter of course, the enemy will quickly find and use effective countermeasures.

A parachute drop in the area of an atomic explosion, carried out "according to the book," can invite a counteratomic strike or other equally dangerous countermeasures in this particular area immediately after the drop.

In the case quoted, the attackers acted "according to the book." Their actions were foreseen quickly by the "enemy" who took steps in advance to destroy the parachute force. They could, however, have acted in other ways. In order to deceive the "enemy" the atomic strike could have been delivered in one area and the landing force dropped in another. There are, of course, many other variations. If the methods of operation are varied it is more difficult for the enemy to guess the attacking side's intentions; in this case it would have made the task of the parachutists considerably easier. The lesson learned was not forgotten.

To avoid a similar situation arising in the near future the commander of the parachute force, officer Galushkin, ordered the capture of the bridgehead to be accelerated and the most vulnerable approaches to be mined. An hour and a half after the drop, having mopped up the "enemy" subunits that had survived the atomic explosion, the parachutists consolidated their position in the bridgehead, dug themselves in, and made out a fire plan. They did not, however, succeed in capturing the bridge over the river. This already had been blown by the "enemy."

Using his initiative in accomplishing his mission, the commander carried out an engineer reconnaissance of the river and found and marked out a suitable crossing point. The presence of a parachute force in possession of a bridgehead cannot help but worry the enemy who will make determined efforts to destroy it and will bring up armored forces from "in reserve" to do this.

A determined armored attack developed one hour and 50 minutes after the landing. The landing force was cut in two and pinned back to the river. A critical situation arose but the commander never lost his head.

Contacting the main land forces by radio he gave the coordinates for direct air and artillery support. Simultaneously, he moved his engineers forward and ordered them to mine the "enemy" approach routes. Coming on to the mines the "enemy" tanks began to act with more caution and the momentum of the attack decreased. The parachutists took advantage of this to establish an effective system of cooperation between the subunits which had been cut off.

The "enemy" realized that any delay in the attack would be to the attackers' advantage and quickly started to organize another assault. But it was too late. Amphibious armored fighting vehicles of a land reconnaissance party had already made contact with the parachute troops. Directly behind them the leading infantry units entered the bridgehead. Once the junction had been made, their combined efforts forced the "enemy" to withdraw.

Essential Factor

This example shows that efficient cooperation between the parachute force, the troops engaged in the main battle, and the supporting artillery and air force is an essential factor of success. If this cooperation does not exist, a modern enemy with a considerable number of tanks and motorized subunits at his disposal can put in a strong counterattack immediately after the drop. Hence it is quite clear that the chances of a parachute force continuing the battle with superior, mainly ar-

mored, forces are very limited. It can only hope to hold out for a few hours. Thus it is essential to determine the time by which land forces must effect a junction before a parachute force is dropped. Any extension of this period can lead to the destruction of the parachutists and the loss of the bridgehead they have captured.

Of no less importance is the ability of the parachute force to take on enemy tanks. Experience shows that such a force will always feel the lack of men and equipment. Only increased mobility and a high standard of organization and initiative in operations can compensate for these deficiencies.

Quite apart from capturing bridgeheads as has already been mentioned, parachute subunits can also operate in the enemy's rear to destroy important targets. In this role parachutists must show a very high degree of initiative, resourcefulness and daring, they must be very fit physically, have a knowledge of the enemy's language, and know how to use his weapons and equipment. The parachutists must be able to drive the enemy's vehicles, operate his wireless sets, and be adept in the art of *Sambo*.[4]

Not long ago on a training exercise a force was dropped for a night operation in the "enemy's" rear. It descended on headquarters, captured signal centers, mined roads and bridges, and took individual soldiers prisoner. For several hours it so confounded the "enemy" that he was forced to deploy armored units to sweep the area.

Parachute training is continuous in most major armies of the world. Shown above, part of a 3,000-man United States paratroop maneuver in Korea.

[4] *Sambo* is the Russian abbreviation for self-defense without arms and involves jujitsu and unarmed combat drills.—Translator.

Quite apart from an exceptional standard of military training and knowledge, operations in these circumstances demand that a man must not lose his self-control even in the most difficult situation. . . . (End of Translation).

Translator's Comments

In reading any Russian military article one is always struck by their naïveté. This must be a result of the general lack of intellect and low standard of education of the ordinary man.

Airborne troops are the élite of the Soviet Army and are of much better quality and education than the ordinary soldier. It is obvious that a very high standard of training is required of them. In particular, the attention they pay to a good knowledge of the enemy—his language, equipment, and weapons—is worthy of note.

In most military articles the Russians repeatedly emphasize initiative and cooperation. This continual repetition indicates that these are two weak characteristics of Soviet troops. One has only to read Soviet publications to realize to what great detail everything is "written in the book." Political indoctrination further imposes a system of uniformity on one and all. There is little scope for personality or initiative.

The Russians stress the importance of field engineering, and all infantrymen must have a sound basic knowledge of it. The division has its engineer battalion and the regiment its engineer company, in both cases an integral part of the formation or unit. In many cases it would appear that the battalion has an integral engineer platoon. Higher up the scale there are the engineer groups containing specialized units.

The Russian is very good at improvisation. Russian engineers get far more practice in the use of local materials and do not depend, to the same extent as we in the West, on engineering equipment and prepared materials. It is a characteristic that will often give Soviet forces the advantage of surprise if it is not fully appreciated.

Training

The Russian is a 24-hour day, seven-day week soldier. Before his national service he receives military training in a youth organization and after his period of service he is placed in the reserve until too old for military service. In theory, he also receives training while in the reserve.

Welfare in the Soviet Army does not imply regular leave, weekends, family consideration, and the *NAAFI/EFI*[5] to the same extent as in the British Army. No doubt as their standard of living rises, they will pay more attention to welfare as such. At present this is not so. The Russian soldier appears to accept his service with equanimity as a debt he owes to the Motherland. His officers are a privileged class, and much better paid. This the Russian soldier considers right and proper. "After all," he says, "the wretched officer must serve for 25 years. Am I not lucky indeed? I have only to endure between three and four years."

The translated article indicates a very high standard of training. The parachute force, presumably a battalion group, beat off tanks as they landed. Ninety minutes after the drop they had mopped up, consolidated, carried out an engineer reconnaissance, and 20 minutes later repelled a deliberate armored attack and were preparing for another. A crowded hour of glory indeed. This was, I know, only an exercise, but on the whole their exercises seem to be made as realistic as possible. Furthermore they have larger and better training areas.

Let us not overestimate the Russian—nonetheless we certainly cannot afford to underestimate him. He is tough, well-trained, and well-equipped; however, he may tend to react less readily in a situation where a set plan goes awry.

[5] Equivalent to the United States Post Exchange and Commissary.

The Strategic Importance of the Sea of Okhotsk

Translated and digested by the MILITARY REVIEW from a copyrighted article by Rear Admiral A. Lepotier in "Revue de Defense Nationale" (France) August-September 1957.

BEGINNING with the Russian settlement of eastern Siberia, the Sea of Okhotsk has provided indispensable communication between the different parts of northeast Asia's immense promontory. It has continued to be of utmost importance, for both the topography and climate of the region have inhibited the construction and maintenance of permanent terrestrial traffic arteries. On the other hand, however, the expansion of the Russian colonization toward the lower Amur Valley, the discovery and development of rich mineral resources, and the strained relations with Japan and the United States have multiplied the necessity for large-scale communication between the establishments on the Sea of Japan, the Sea of Okhotsk, the Bering Sea, and the Siberian Arctic coast.

The only sea connection between the Sea of Okhotsk and the Sea of Japan is the straits located west and south of the large island of Sakhalin. The only possible maritime connections between the Sea of Okhotsk, the Pacific Ocean, and the Arctic Sea are the loopholes in the string of Kuril Islands. This explains the century-old fight between Russia and Japan over the possession of these islands.

Sakhalin

Called the most elongated island of the world, Sakhalin is known to the Chinese under the name of Sagalin and to the Japanese as Karafuto. Sakhalin did not show on European maps until 1760 when it was adapted from Chinese sources because, in 1643, the Dutch explorer De Vries mistakingly considered the southeastern part of it to be an extension of Hokkaido.

Count La Pérouse was the first European seafarer accurately to map the continental and insular shores of the Gulf of Tatary and the strait named after him which separate Sakhalin and Hokkaido. He learned from natives that there was a shallow passage between the island and the continent.

In 1805 Adam Krusenstern, the first Russian seafarer to come from Europe to the Far East, explored the northern part of the island and named the northwestern bay Nadyezhda. When he ran into the alluvium deposited by the Amur River between this part of the island and the mainland, he assumed that there had to be an isthmus linking the island to the continent.

Forty years later General Muraviev, Governor of eastern Siberia, was commissioned to find an outlet to the sea for his territory along the Amur River. He instituted a project of exploring the Gulf of Tatary and in 1849, navy Lieutenant Nevelskoi was the first European to pass through the strait to discover that it frames the southern part of the Amur Delta. Lieutenant Nevelskoi, promoted to commander, established Makhachkala, and also raised the Russian flag in Nikolaevsk in the estuary of the river.

The admiralty proposed to fire him. The czar, on the contrary, promoted him. He was then made governor of Amur province. Boshniak, Nevelskoi's lieutenant, explored Sakhalin where he founded Aleksandrovsk and Konstantinovka. Promoted to rear admiral, in 1853 Nevelskoi took Sakhalin as a Russian possession by landing at Tamar-Aniwa, on the bay at the southern tip of the island, defying the protests of Japanese residents.

When the Crimean War broke out, General Muraviev prepared to fortify the new Russian bases on the Sea of Okhotsk and

the base a Petropavlovsk, using the Amur riverway for the first time. On 14 May 1854 he loaded his reinforcements on approximately 100 barges and rafts moored at Nerchinsk on the Shilka River. Men, supplies, guns, and ammunition descended on this river, then on the Amur, and past the Chinese citadel of Aigun. At Mariinsk he received a report that a flotilla was waiting in nearby De Kastri Bay.

The general crossed the isthmus between Lake Kisi and De Kastri Bay with 350 Cossacks and 20 artillery guns with their ammunition, which he loaded on the flotilla, and ordered it to sail for Petropavlovsk. These reinforcements arrived there a few days in advance of the Anglo-French armada and thus caused the failure of the allied mission on 4 September 1854.

Seapowers

Knowing that the two seapowers would be back the following year for a show of force, the government in St. Petersburg ordered the naval base in Kamchatka to be evacuated. This mission was accomplished successfully just a few days before the new Anglo-French armada showed up, and the convoy took refuge in De Kastri Bay where General Muraviev had mounted a battery. Nevelskoi succeeded in bringing all ships to safety on the Amur River by sailing through the small channel of the Tatar Strait while batteries of heavy artillery, mounted on a small peninsula dominating the channel, kept the allied ships at bay. During the same year (1855), in the Treaty of Shimoda, Russia and Japan agreed on the principle of a coadministration for Sakhalin, with details and clauses settled in the convention of 1867. However, in 1875, in the Treaty of St. Petersburg, Sakhalin was awarded to Russia and the Kurils to Japan.

In the first war between Russia and Japan the domination of the straits which gave access to the Yellow Sea and the Sea of Japan was decisive. The major part of the Russian armada was blocked in Port Arthur and the cruisers trapped in Vladivostok. The relief fleet, commanded by Rodzhestvensky, arrived in the Far East after the defeat of Port Arthur and could reach Vladivostok only by forcing open one of the Japanese-held straits. The fleet's fate was sealed in the Tsushima Strait between Japan and Korea.

The geographic blockade of the Russian ports of the Sea of Japan and the Sea of Okhotsk became even more grave when Japan, after her victory, received the part of Sakhalin south of the 50° parallel in the Treaty of Portsmouth. Japan also received fishing rights along the coasts of the Sea of Okhotsk and the Bering Sea.

For Japan these demands were dictated chiefly by reasons of demography and food supply. In 1941 there were 380,000 colonists in the Japanese part of Sakhalin; from the strategic point of view, all deep-water accesses to Russian ports on the two seas were now in Japanese hands. However, in order to keep Russia from entering the war against her, Japan, from 1942 to 1944, tolerated the passage of ships bound for the far eastern terminals of the Trans-Siberian Railroad. *The cargo of these ships was war material from the United States—her enemy—and destined for the war against Germany—her ally!*

The Kuril Barrier

The string of the 32 Kuril Islands, stretched out like a huge fishing net from the southern tip of Kamchatka to Hokkaido, constitutes a real geostrategic screen 680 miles long between the Sea of Okhotsk and the Pacific Ocean.

In 1712 Kosyrevski, an adventurer, was sent out by the Governor of Kamchatka to explore these islands off the southern point of the Kamchatka Peninsula, after natives had brought word of their existence. He took possession of the first two islands, naming them Kurilsk.

Spanberg and Watson explored the entire string of Kuril Islands in 1739 bring-

ing back information which gave them an approximate location on European maps. In 1787 La Pérouse, after having entered the Sea of Okhotsk through the strait which carries his name (also known as Soya Strait), explored the coasts of the southern islands facing the Sea of

Okhotsk, and returned to the Pacific through an outlet which he named Boussole Channel.

In 1806 the archipelago, occasionally visited by Russian trappers and Japanese fishermen, became the object of a symbolic annexation by the Russian Navy Lieutenant Davidov, commanding officer of the brig *Juno*. Then, after 1830, the Russian American Company officially laid claim on the islands. The agreement of 1875 allotted them to Japan, but the hard climate and the sterile volcanic soil inhibited colonization except on the southernmost islands. However, fishing was good and each summer thousands of Japanese fishermen went there and put the fish processing factories to work.

When Lindberg flew down from Alaska in 1932, Japan became aware of the paramount strategic importance of this chain of mountain peaks emerging from the ocean. These islands, together with the Aleutian Islands, mark the shortest route between the American northwest and Japan.

The island group of Paramoshir-Shumshu next to Kamchatka are no more than 750 miles from Attu, the westernmost of the American Aleutian Islands, and 250 miles from the Russian naval base of Petropavlovsk. They dominate the Kuril Strait through which the Soviet ship routes link the Sea of Okhotsk with Petropavlovsk, Anadyr (65° N, 178° E), and the Arctic seaway.

During World War II the principal air-naval bases of the Japanese were established on the channel between these two islands. From there, the Japanese forces set out to occupy Attu and Kiska. Also at a deserted roadstead of one of the central Kuril Islands, the secret concentration of the forces took place for the raid on Pearl Harbor.

The Insular Strategic Breach

In his speeches, Mr. John Foster Dulles, the American Secretary of State, does not conceal that the American strategy in the Far East is geared at keeping control of the strings of islands stretched out in front of the Asiatic Continent, in order to "make the Pacific a friendly ocean." Here geography helped the United States in her policy of containment.

The "Big Three" at Yalta and Cairo

decided that after the Japanese capitulation the Soviet forces—as price for their belated intervention—would be in charge of the military occupation of south Sakhalin and the Kurils "until the status of these islands was determined by the peace treaty." It appears likely that the later consequences of this concession were not considered extensively.

South of the Kuril Islands proper there are the five small islands of Habomai, and Shikotan Island—prolongations of the eastern tongue of Hokkaido. In the negotiations of Yalta this group of islands was not considered.

After having occupied the Kurils and finding no Americans on this small archipelago, the Soviet forces likewise occupied these small islands which they still hold.

From the Japanese fishing port of Nemuro, on the inner side of the eastern tongue of Hokkaido, one can clearly spot the Russian guards on Kaigara—one of the Habomai Islands. Kunashiri, the first major Kuril island northeast of Hokkaido, is only three miles from Point Sipetu on Hokkaido. To the north, Sakhalin is about 16 miles away.

Naturally, the "iron curtain" strait of Nemuro has been the scene of many incidents since 1945. Thousands of Japanese fishermen, who formerly gathered a major part of the subsistence for the Japanese population along all the coasts of Sakhalin and the Kurils, were abruptly confined to the waters of Hokkaido. Frequently, they have been interned by the Russians on the pretext of espionage, after they became lost in the fog, or drifted away in a storm, especially on the eastern coast. Within 10 years, 120 Japanese fishing vessels were seized, and about 20 of them were released only after the Russian-Japanese negotiations had started in London in 1955. Of course, an agreement about fishing was signed on 6 April 1957, but it is far from being satisfactory to Japan.

Problem of the Straits

In the strategic domain, the Russians—not satisfied with the absolute control they gained over all passages between the Kurils—made big efforts to set up rules for the access through the straits of La Pérouse, Nemuro, Tsugaru, and Tsushima.

During the preparatory discussions for the Treaty of San Francisco, the Russian delegate wanted to introduce an article which stipulated that:

The straits of La Pérouse and Nemuro along the shores of Hokkaido, as well as the straits of Tsugaru and Tsushima, shall be demilitarized. These straits shall always be open to all merchantmen of all nations.

The aforenamed straits shall be open to warships of only those powers which border the Sea of Japan.

This meant the banning of the United States air and naval forces from the Sea of Japan that also touches the eastern shores of Korea. After her proposal had been rejected by the other powers, the USSR refused to sign the San Francisco treaty.

During the Russian-Japanese negotiations in London in 1955, and in Moscow in 1956, aimed at "putting an end to the state of war between the two countries," the Soviet Government maintained its desire for regulating the access through the straits. The Soviets demanded that the warships of the riparian powers should have access to the Sea of Japan and the Sea of Okhotsk only through the straits of Nemuro and La Pérouse, that is, under joint Soviet and Japanese control.

With regard to the "definitive status" of the islands, which had been occupied by the Soviet forces in accordance with the agreements of Yalta, the position of the USSR again was made clear in San Francisco. Mr. Gromyko wanted an article of the treaty inviting Japan "to *restitute* Sakhalin, and to *transfer* the Kurils to

the USSR." In fact, Japan abandoned her rights on the islands in the Treaty of San Francisco but, since the USSR did not sign it, the Japanese Premier, on the eve of the conference in 1955, declared that he would demand the restitution of the islands of Habomai and Shikotan to Japan, and that he would not give up claim to the southern Kuril Islands that were always occupied by Japan.

At the end, the agreement signed in Moscow on 19 October 1956 arranged for the restitution to Japan of the small islands of Habomai and Shikotan only "after signing the peace treaty," which disappointed the Japanese.

The "Iron Curtain" of Hokkaido

The Soviet intention of keeping Sakhalin and the Kurils entirely in their hands became evident from the beginning of the occupation. It could be seen in the expulsion of the Japanese, Russian colonization, and Russification of geographic names, notably for the glorification of national pioneers. Thus in south Sakhalin Honto became Nevelsk; Tonnai, Bosshniakovo; Otomari, Korsakov; Shirutoru, Makarov; and the ancient capital of Japanese times, Toyohara, became Yuzhno-Sakhalinsk.

Intense propaganda was required to recruit Russian settlers. After a visit to the Kurils, Konstantin Bagadin launched an appeal in the style of the most traditional "colonialism" with an article in *Komsomolskaya Pravda*:

There, vast fields are wide open to the energetic and constructive activity of our youth. Can our boys and girls remember their ancesters of old times: Those intrepid seafarers, those untiring explorers who, several centuries ago, did everything to render the Kuril Islands ours, and can they [the boys and girls] dedicate their abilities to the revival of those faraway indisputably Russian lands?

The colonists were awarded an allowance of 20,000 rubles—one-half of it repayable within 10 years. Mr. Mikoyan gave his personal attention to the success of this recent colonization project.

The vital sea routes linking the centers in the Amur Valley, Khabarovsk, Komsomolsk, Nikolaevsk with Okhotsk and Magadan and with Petropavlovsk, Anadyr, and the Arctic seaway, are protected against actions from the Pacific Ocean.

However, the United States forces on Hokkaido still control the southern bank of the La Pérouse Strait, the only passage for big cargo vessels from the Sea of Okhotsk to the ports of the Maritime Territory—the terminals of the Trans-Siberian Railroad—Vladivostok, Nakhodka, and Sovetskaya Gavan.

American radar stations on the island of Hokkaido supervise every movement in the air and on the sea along this "iron curtain." Interceptor aircraft take off instantly from the airbase of Shitose, located in the southern center of the island, when a foreign plane approaches.

This ineluctable guard allows the Americans to control the reinforcements to the Soviet naval forces based in the Sea of Japan by fresh units such as arrived from Europe through the Arctic in 1956.

Under these conditions, the strategic importance of the ports on the Amur and on the Tatar Strait becomes evident. Unfortunately, the access to all of these is restricted by the shallowness of the meandering channels leading to them. It does not seem impossible to improve these channels by dredging; yet, in 1951, Western authorities were rather skeptical when information from a Japanese source announced the closing of the strait by a dam in order to prevent ice from the north drifting southward. If such a project had materialized, it certainly would have provided an additional strategic value by permitting ships to pass through during times when it was normally closed by ice.

No large undertaking, economical or military, can take place on the two enor-

mous promontories with which Soviet Asia and United States-Alaska face each other without maritime communication. This is even more so on the Asiatic side than on the American side where there is a strategic terrestrial highway.

The most vital Soviet maritime communication lines are those of the Sea of Okhotsk. Their geostrategic protection has been greatly improved by the occupation of the insular triangle of Sakhalin and the Kurils. The southeastern corner of this triangle, however, is in the hands of alert American forces. The air-naval "iron curtains" of Bering and Hokkaido are the critical points in this sector.

Logistical Support Under Modern Conditions

Translated and digested for the MILITARY REVIEW from an article by Lieutenant Colonel K. Leonov in "Tyl i Snabzheniye Sovetskoy Armii" (Logistics and Supply of the Soviet Army) (USSR) January 1957. Translation by Major Michael B. Gavrisheff, United States Army Reserve.

THE art of achieving a rapid and decisive victory over the enemy with the minimum losses to personnel and equipment requires continuous and inquisitive search for new armaments, better organization of tactical groupings, and reliable methods of administrative support. The one able to solve these problems in peacetime will have greater expectations for success in war.

The history of armies and warfare teaches us that the economic level of a country and the achievements of science have always been of decisive influence on the organization of armies, their tactics, and the methods employed in administrative support. Consequently, problems on the organization of armies and modes of conducting combat, and, equally, problems of material, technical, and medical support must be solved in relation to the economic resources of the country and its technological achievements.

However, it would be a mistake to suppose that questions relating to the organization and operation of the logistical services can be solved solely on the basis of economic and scientific achievements. The logistical rear is an integral part of the forces in the field. Therefore, its organizational structure must be in complete accord with the organizational structure of combat units, and its functioning must be related to the type of combat operations. Any violation of this rule may place the logistical rear in a position of not being able to provide continuous administrative support to units in combat. Thus the organization and operation of the logistical rear depend primarily on the organization of combat units and the character of combat operations.

Mission of Logistics

Modern war is characterized by high maneuverability and fluidity. It will be accompanied by rapid changes in situations and great, uneven expenditures in supplies. This complicates the operations of the logistical services, and the battlefield employment of mass destruction weapons presents a number of additional difficulties.

Notwithstanding the changes that have occurred in matériel, in the organization of combat units, and in the character of combat itself, the primary mission of logistics remains: to provide timely and complete administrative support to combat units.

Logistical support units must be prepared fully for operations under any conditions. In addition to modern technical

equipment, a high degree of combat training is required for logistical personnel.

The high mobility of troops and the dynamic character of combat will require that logistical support be provided to troops regardless of their condition, activity, or time of day. Therefore, logistical services must be highly mobile.

The mobility of the logistical rear must not depend on the type of terrain and condition of the roads. Combat operations may take place under the most varied conditions, and the logistical rear will be required to follow relentlessly, fully prepared to provide support at any given moment. This means that support units must have organic transportation capable of following immediately in rear of combat units without inhibiting the maneuver of combat forces or diverting strength and means away from them.

Obviously, the problem of increasing the mobility of the logistical rear initially is tied to the solution of the organizational structure of administrative support units and facilities, to acceptable levels of mobile reserve stocks, to the organization of transportation facilities, services, and to a number of other factors.

Mobile Reserve Stocks

When we consider mobile reserve stock levels we cannot escape the following contradiction: increased expenditures of supplies in modern combat require an increase in transportation, but the commander, in making his decision, must be certain that his mission will be fully supported logistically; and an increase of reserve stocks increases logistical operations which in turn reflects adversely on the mobility of the logistical rear.

The problem of mobile reserve stock levels must be solved on the basis of properly calculated average daily consumption rates, resupply capability, and a number of other factors. The conduct of battle has always involved the expenditure of various material supplies, the reserves of which must be restocked through deliveries.

In a situation when the offensive progresses at a high rate during night and day, it will be necessary to resupply stocks in such a manner that logistical operations do not impede the forward movement of troops. Consequently, transportation units must work with the minimum expenditure of forces and time in delivering supplies. The mechanization of loading and discharging operations is of great importance, not only at supply depots and points, but also when delivering goods directly to combat vehicles and artillery positions.

Packaging

The various classes of supply intended for combat troops come in a great variety of packaging and different weights. This complicates their loading on vehicles, often resulting in vehicle capacities not being fully utilized. It also increases the time required to unload a motor convoy. A standard package, similar to a medium-size railroad container, which may be prepacked at supply depots and loaded on vehicles with the aid of small cranes must be developed.

Packaging for the transportation of POL (petroleum, oil, and lubricants) must be mentioned separately. It would be sensible to develop some kind of soft packaging. This would have several advantages: smaller space requirements, more adaptable for transporting (and this is very important when displacing POL depots), and no special equipment needed for storage. General application of soft packaging must be found when supporting ground operations, airborne operations, and in the support of forces making an encirclement.

Distribution

In order to provide for timely and continuous support operations in rapidly changing situations on the battlefield, firm direction and control of distribution is

essential. Consequently, it is necessary to have sufficient means of radio communications. However, due to interference that the enemy may create on the battlefield, distribution control cannot be achieved solely by this means of communications. Therefore, the chief of logistics also must have mobile means of wire communication. In addition, regulating services must be well-organized.

Due to the battlefield employment of mass destruction weapons, distribution control may be disrupted even when the logistical services have a sufficient amount of different types of communications. All measures must be taken to develop uniformity of views on organizational questions and methods of operation of the logistical services. Logistical personnel must acquire independence in the solution of problems before them. This will ensure timely and complete support of units in combat, even when positive distribution control in rapidly changing situations has been lost.

Air transportation, especially helicopters, must find general employment. In connection with this, logistical support units must have means to communicate with aircraft. In addition, service support units must be capable of discharging supplies from aircraft in the shortest period of time so as to load the sick and wounded requiring evacuation. Air transportation must be released quickly, and additional transfer operations must be eliminated.

US Army Photograph

Helicopters are a flexible means of transportation. Above, a United States *H-21C Shawnee* uses an external sling to carry a 105-mm howitzer.

We have considered only a few of the requirements placed before support organizations. But, from the above, it can be concluded that for timely, continuous resupply of expended reserve stocks, a powerful means of transportation with good overland capability is still not enough. It will be necessary to solve many other problems of an organizational and technical nature.

Unit Supply

As is known, during World War II, the principle of supplying from higher to lower units (unit supply)—when the senior commander delivers supplies to his subordinates using his own means of transportation—was in effect. Under conditions of relatively low mobility, absence of a sufficient amount of transportation, relatively low rates of forward movement, and the great distances between field army and division supply depots (and division and regimental supply points), this principle was the only correct one and was fully justified. It ensured effective utilization of the weak divisional transportation to supply regiments, and enabled the regiments to provide timely support to battalions.

The comparatively low expenditures of material supplies in combat permitted army transportation to accomplish the entire volume of supply without meaningful transportation support from the army group.

However, even during the Second World War, this principle was not always adhered to: regiments brought supplies from division depots using their own means of transportation, and division transportation was, at times, used in the field army echelon. Today, there are even greater reasons to suggest that situations will be created in which the principle of unit supply will be illogical. These situations are determined largely by the thought that troops are fully motorized, their maneuverability on the battlefield has been enhanced, the expenditure of material resources has increased, and logistical support units have been equipped with modern vehicles of good overland qualities, increased speeds, and large capacity.

In order to provide timely logistical support using the transportation of the next higher echelon, that echelon must possess a great number of motor vehicles. But the facilities of the combat units would be idle because, in providing support to lower units, each vehicle of the higher echelon would need to make only a few miles a day, and lower echelon transportation would be used even to a lesser extent.

Finally, it should be remembered that the concentration of a large number of vehicles in the rear of combat units, not only those of the units themselves, but also of those coming with supplies from the higher echelon, is undesirable. This will expose the troops and may even cause unjustified losses in vehicles.

The changes that have occurred in the mechanization and motorization of combat units and their logistical services are characteristic of modern warfare. These are factors that cannot be ignored when organizing logistical support. It will be necessary to deviate from the unit supply principle more often than has been the case during the Second World War, organizing instead supply by the lower unit using its own motor transportation.

Medical Support

Modern combat presents a series of new requirements in the organization of medical support. Enemy employment of atomic and other mass destruction weapons may, in one instant, cause a great number of casualties over a large area.

Under these conditions timely location, concentration, and evacuation of casualties to aid stations are of prime consideration. Medical organizations must have the necessary means such as sources of light which will not expose medical personnel on the battlefield at night and which, at the same time, provide normal conditions for work. Medical units also must have highly mobile means of transportation.

The rapid forward movement of combat units in the offensive will require frequent displacement of medical installations. In order to provide assistance to the wounded,

regimental medical stations usually have to halt. Even when medical personnel are well-trained, a great deal of time is needed to set up and prepare for operations. Some time is required to process each casualty and prepare him for evacuation. Consequently, when the flow of wounded is great, the distance between medical stations and combat units in the offensive will either increase to considerable distances, or medical support units will be required to decrease the amount of assistance.

To prevent the occurrence of either case, it is important to ensure the functioning of aid stations while they are on the move or when making momentary stops. This can be achieved if the medical service is provided with various mobile types of installations such as surgical and bandaging sections situated on trucks or trailers.

The timely displacement of medical stations in rear of frontline units depends largely on the rapidity of evacuation of the sick and wounded. Therefore, medical stations must not be dependent on a special allocation of transportation for evacuation purposes or on the use of empty vehicles moving to the rear. They must be able to perform evacuation with their own organic means of transportation.

As to medical support provided in case of radiation sickness, a subject reserved for specialists, a number of problems also must be solved so that medical support will always be available to troops in the complex conditions of modern warfare.

Subsistence

The organization of subsistence supply is no less important. The preparation of hot food and its distribution to troops in combat is exceptionally difficult. Preparing food for cooking and the cooking itself should be done while on the move. It would be logical to install kitchens on trucks for this purpose. Obviously, all other mechanisms used for the processing of food products also must be installed in vehicles.

Battalion food service points should be supplied with semiprepared food products. This will simplify their final preparation and increase the speed of cooking considerably.

The dry ration issued to troops must be such that no great amount of time, effort, or special equipment should be necessary to prepare it for consumption.

When transporting and storing subsistence supplies, special attention must be given to protection from the effects of atomic radiation, and bacteriological and chemical agents. Special packaging will be required. The packaging must be cheap, light, and convenient.

Rear Areas

Another problem of great significance must be mentioned. In modern combat the logistical rear will operate under constant threat of enemy attack from the air and deep penetrations by enemy ground forces. Also, the possibility of attack by long-range artillery and guided missiles cannot be excluded. Consequently, rear area defense and security is of prime importance. These measures usually are undertaken by organic means. Therefore, the logistical rear must be provided with equipment that will permit a great amount of engineer work and modern armaments to defeat enemy ground penetrations.

Conclusions

Without exhausting all the problems connected with the successful operation of administrative support units in modern combat we can make certain conclusions.

A primitively organized logistical rear is incapable of providing timely and full support to combat units. In order that logistical services may be able to cope with their mission, further research will be necessary in the field of mechanization and motorization of logistical operations.

Administrative support for combat units must be highly mobile, flexible, and easily controlled. Logistical support units must be prepared to operate while on the move or during short halts.

The motorization and mechanization of the logistical rear must not be a burden to combat units. Equipment for the logistical services must be simple in construction and handling, efficient, and flexible to the maximum degree.

In organizing forward movement of supplies it is desirable that the use of transportation be productive in both directions and that it provide timely delivery of goods to combat units with the minimum expenditure of means.

Arms and matériel for logistical personnel and installations must ensure reliable defense and security from possible enemy attack.

In this manner modern logistical support services, both in their organizational structure and modes of operation, should fully conform to the organizational structure and operations of tactical units.

War Psychiatry

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THERE is no data about the frequency of mental illness among the warriors in ancient times.

At the beginning of the last century the medical officers of the armies in the Napoleonic Wars described different types of mental disturbances suffered by soldiers in combat. But it was only in the last two world conflicts that the top commands and the medical officers could evaluate the rise in mental disturbances caused by war among the recently recruited individuals as well as among the soldiers in combat or waiting to enter combat, those in distant and solitary outposts, or those confined in prisoner of war camps.

During World War I the Germans witnessed a large increase in psychoneurotic cases in their army. In the British Army, out of the 1,043,653 casualties due to sickness, 34 per thousand were neurotic cases. There were occasions when 40 percent of the total number of patients evacuated to England were neurotic cases. The Canadians registered 24 mental cases per thousand out of 180,496 patients, while the American Expeditionary Force registered only 9.5 per thousand.

The smaller proportion of neuropsychiatric cases among the Americans—when compared with those of the British and Canadians—has been attributed to the fact that their troops were under fire for a shorter time and also, in part, because their recruiting methods improved their medical aspect after General Pershing made the appropriate recommendation to the Army General Staff. He pointed out that among a large contingent of troops sent to Europe, about 3,000 showed signs and symptoms of general progressive paralysis, locomotor ataxia, epilepsy, psychoneurosis, psychosis, and mental retardation.

These medical and military experiences of World War I were put to good use later by the German Army in reorganizing its military neuropsychiatric services. The Germans demanded not only the highest physical qualifications, but also the highest mental aptitudes and, particularly, proved resistance to emotional upset in

recruiting personnel for their air, naval, and ground forces.

The United States entered World War II without having had time to reorganize properly her medical services in the neuropsychiatric aspects, and during the first three years of the war paid dearly for this neglect.

At the end of the war, in an army three times greater than that of World War I, there were 10 times more neuropsychiatric patients hospitalized.

Out of about 12 million individuals subjected to preinduction physical examinations, nearly five million were rejected for physical incapacity. Of this number nearly two million were rejected for various mental deficiencies. Of those accepted for service and who participated in the war, about one million were discharged for various physical disabilities. Nearly one-half this number suffered from neuropsychiatric disorders. In the wars of the last century and the beginning of the current century such diseases as typhus, typhoid fever, respiratory and gastrointestinal ailments, tuberculosis, venereal diseases, and malaria caused great havoc to the soldiers in the field and, in more than one case, contributed to the defeat of some armies. These failures were necessary to convince the supreme commanders and staffs of armies that the achievements of preventive medicine should be applied systematically to maintain the optimum level of combat efficiency of their units.

The low proportion of these contagious diseases at present is evidence of the change in attitude of the commanders, especially when the higher commanders set the example by taking immunization shots and prophylactic pills (atabrine discipline) in the presence of the troops.

This change in attitude was most marked when the commanders ceased to consider the medical service as exclusively humanitarian and started to view it in its true light, as a militarily important factor designed to contribute to success by maintaining the fundamental element of all wars—man himself.

Military Point of View

From the military point of view the increase in mental casualties presents great handicaps to the offensive and defensive capability, discipline, and logistical systems of armies in the field. The large numbers of individuals emotionally or mentally disturbed sap the strength of the units, especially when they occur at such a fast rate as to prevent rapid replacement.

Discipline is jeopardized. Individuals with depressive emotional reactions, irascible individuals who pick fights with their comrades or show insubordination toward their superiors, or those who expose themselves to sure death from enemy fire surely have an adverse effect. Also, individuals with convulsions, sudden blindness, or loss of speech constitute in various forms a grave problem which lowers the morale of the troops, exasperates the officers, and decreases the efficiency of the units.

The problem of replacements for the thousands of mental casualties also is a serious one. There are times when there are not sufficient replacements to compensate for these types of casualties. The medical service, which needs personnel and time to take care of the wounded, frequently is overtaxed by the continuous flow of soldiers with nervous disorders requiring immediate treatment.

The evacuation of these mental casualties from the front to the various medical installations where they can recuperate imposes a severe strain on the evacuation service and is another factor which decreases the military efficiency of armies.

Finally, and from the economic viewpoint, there is the enormous monetary loss caused by individuals who have been fed, clothed, and trained at great expense.

Many of them destroy costly arms and equipment due to their lack of psychic control.

Add to this the expenses of hospitalization and specialized treatment, and consider how the drain on the public treasury grows with the payment of compensations and pensions. In the United States nearly one-third of the hospitals run by the Veterans Administration are devoted to the treatment of neuropsychiatric patients. The amount of money paid for pensions of this type invalid from World Wars I and II totals billions of dollars.

Reactions

Certainly, war psychiatry treats individuals who exhibit acute symptoms of psychosis during combat, and who are so depressed and melancholic that they become rigid and run aimlessly in panic, sometimes in the direction of the enemy. They may start talking incoherently without being able to recognize people, have bursts of insane rage, develop amnesia, or have visual or auditive hallucinations. Those who commit suicide or criminal acts also fall in this group.

But these cases represent only a small proportion of the psychic reactions in combat—from six to seven percent—and constitute war psychoses, generally transitory. Much more frequent are the neurotic or psychoneurotic reactions which, although not causing insanity, still incapacitate the individual for action. Such reactions are intense feeling of anxiety accompanied by anguished fear, tremor of the hands, cardiac palpitations, vomit, diarrhea, dizziness, acute headache, intestinal and urinary disorders, insomnia, loss of strength, absurd fear of insignificant things, and disturbing obsessions. Other reactions can be convulsions or paralysis of arms or legs, loss of memory, loss of voice or hearing, or inability to stand up or walk.

Psychotic or neurotic reactions make their appearance in some cases immediately after military situations of great tension and in other cases after a period of time has transpired following their occurrence. Many of these reactions represent simply the abnormal intensification or persistence of emotional alterations experienced by everyone faced with danger.

Psychological Causes

What is the psychological cause of these mental derangements? It is generally accepted that various factors should be considered:

1. A *constitutional factor* innate in the individual, including mental retardation. A large number of acute reactions of mental confusion and hysteria are observed in mentally retarded individuals.

2. *Predisposing factors* which include:

a. History of nervous disorders in the family, mental disorders during infancy, or high-strung emotional sensibility.

b. Fatigue, exposure to extreme cold or heat, deficient or irregular meals, and physical weakness due to other ailments. To these must be added the effort, so difficult for many persons, of adaption to living together with other individuals of vastly different characters, social positions, and personal habits, and the restrictions imposed by military life upon the freedoms enjoyed as civilians. Here also must be considered the disagreeable effort of obeying orders for which no clear justification is seen, particularly when the individual feels an intellectual superiority over the person issuing the order.

3. The effect upon the morale of the individual of such matters as unfavorable turns in the war, bad news from home, and rumors spread by the enemy in his "psychological war" efforts.

Thus it can be readily seen that individuals with a weak capacity to resist

emotional tension will present more or less serious symptoms, whether or not they are in combat.

It should be pointed out that 60 percent of the psychic disorders appear during situations of relative calm, and not actual combat. However, it has been shown that in difficult, long drawnout battles of days or weeks, where the outcome is uncertain, the units carrying the burden of the battle can have as many as 50 percent of their personnel stricken with emotional disorders. Cases have been cited of units in which virtually all personnel showed signs of abnormal emotional behavior. This indicates that combat can cause mental derangement even in the best balanced individuals who are considered as having great resistance to emotional tension.

There are two important causes in the production of all abnormal reactions already cited:

First, and most powerful in combat, is the struggle between the "instinct of preservation" and the "sense of duty." The former makes us avoid dangers to prevent death, the latter forces us to face danger and even sacrifice our lives in defense of family, home, and country.

The possibility of being killed or wounded by enemy fire awakens the primitive reaction of fear which everybody experiences when faced with danger. When the mechanisms that control fear are weak, or when the dangers are so intense or frequent that they overtax the efficiency of such control mechanisms, even if they are normal, there will be manifestations of abnormal conduct—trembling, dizziness, panic, convulsions, depression, and schizophrenia.

The second cause of abnormal emotional reactions—which predominates in the waiting phase between combat actions—is that generated by homesickness or what is called the "anxiety of separation." This is found not only among recruits during their first year of service, but also among the "old soldiers" who wait for the attack of the enemy or who are assigned to solitary posts, and those in prisoner of war camps.

Both factors—fear and separation—affect even the most normal individuals when they are subjected to continued exposure to combat. These factors provoke increasing emotional tension which the individual tries to counteract, thus bringing about the symptoms and the irregular or outright abnormal behavior which pathetically indicates how the individual tries to escape cruel reality.

Prevention and Cure

Military leaders have always asked the medical service two questions relative to these depressing aspects of modern war. Can these mental disorders be prevented? Are they curable?

The answer to the first question is, yes, they can be prevented. For this purpose, and as a first step, a series of recruiting regulations have been issued with a view to selecting only individuals capable of resisting the violent psychological impact of military life. Additionally, recommendations have been made to officers in command pertaining to management of men and situations. Finally, a series of measures have been adopted which tend to neutralize the growing anxiety experienced by recruits taken out of their familiar environment.

The recruiting system should eliminate all individuals with mental disorders, no matter how light or incipient these may be. All mentally retarded individuals, and all those who, without being sick or mentally retarded, can be called perverse.

To implement this selection the recruiting system has suffered a transcendental change. It is no longer enough to select individuals physically fit by their height, complexion, vigor, or because they are free from heart or lung diseases or the many other disqualifying ailments. Now,

in addition to the physical aptitude factor, their mental aptitudes are evaluated to include both the intelligence and the so-called "resistance capacity to emotional tension" of the individual. The "resistance capacity" permits adaptation to changing situations and maintains the balance of the individual's personality in the face of the disturbing shocks originated in the external environment and in the interior world of each individual.

The task of determining whether this resistance capacity is adequate or insufficient is very difficult. It is effected through an interpretation of all significant episodes in the life of an individual, that is, making a biographical synthesis of the candidate and giving it a psychological and medical interpretation. If this interpretation is favorable, it generally can be predicted that the candidate will resist the rigors of discipline, the hardships of military life, and the separation from family and familiar environment.

It can be understood easily why the old recruiting system which employed individual officers canvassing the cities and countryside for recruits, with nothing to guide them but their commonsense and experience, has given way to a modern system. The new system includes psychiatrists, psychologists, several specialists, and administrative personnel who collect information of the antecedents of the individual from records of schools, Red Cross, hospitals, employers, and civil authorities. Although this modern system may seem costly, the experience of the last war shows that it represents savings in future expenditure, especially in pensions and compensations for mental ailments. The purely military reasons have been stated.

This new concept is synthetized in a circular about medical criteria for recruiting which the United States Army Surgeon General, with the approval of the Chief of Staff, issued not only to the medical officers but to the military commanders as well. The circular contained the following thoughts:

The Army is not, in any sense, a social service, curative agency, paradise for vagabonds, or correctional institution for maladjusted or mentally retarded individuals or chronic delinquents. Neither is it a health center to improve the poorly developed or those suffering from malnutrition; nor a psychiatric clinic in which to acquire emotional adjustment by adults. Therefore, there is no place in the Army for the physically or mentally weak, potentially psychotic or psychoneurotic individuals, or those who constitute a discipline problem. The maladjusted individuals in civil life will surely be worse so in the service.

If, in spite of this careful selection, any undesirable candidate is inducted, there still is a possibility of eliminating him during his basic training. If recruits pass this period and show good adaptation, they are accepted definitively.

There may be some who would question the elimination of criminal or perverse individuals on the basis that a number of soldiers who performed heroic acts in World War II had antecedents of abnormal conduct.

From these isolated cases some persons conclude that the army should accept everyone, regardless of their mental and moral background. This incurs the same error as those who protest the elimination from the service or at induction of the maimed, claiming that military history has cases of physically handicapped individuals who distinguished themselves in military action.

Due to the complexity of armament and tactics, modern armies require the maximum mental and physical effectiveness of their members. The defense of the nation cannot be risked with the acceptance of individuals who do not meet the qualifi-

cations established by the medical experience of this century.

If a good recruiting system prevents a considerable proportion of mental disorders in the field, it also is important to point out the role of the leaders in this prevention. It is well-known how the men in a unit in peacetime are demoralized or behave in an insubordinate manner when they see that their immediate commander treats them despotically or ignores the military regulations or customs of the service prescribing the proper behavior in consonance with their rank and position of command.

In time of war the good qualities or defects of leaders exert even a more powerful influence over the behavior of their subordinates. It is axiomatic to say that "the qualities of the commander of any type of unit create the morale and effectiveness of the group in combat."

There will be *esprit de corps*, high morale, and great combat effectiveness when the leaders understand the basic principles of war, know the character and aptitudes of their men, inculcate in others their faith in the ideals and principles of the cause, and demonstrate initiative and courage in the decisive moments of battle. Regardless of the size of their commands, these leaders are important factors in victory as well as in the mental health of the combatants.

On the other hand, it can be readily seen how depression and the spirit of defeat can spread through the command when the leader is unfair, despotically rigid, indifferent, indecisive, or, much worse, cowardly. It is not strange that such a leader would fail in the military missions assigned to his unit. It also is logical to find that his subordinates present acute emotional derangements in which there is a mixture of rage, resentment, and, above all, fear of death. These feelings lead to panic when the will no longer controls them and the morale is shattered by the loss of faith and confidence in the commander and victory.

The homesickness experienced by recruits is neutralized with a series of measures such as dependable mail service, entertainment provided by special services, opportunity to attend religious services of the individual's choice, or passes and leaves to visit home or get away from the combat zone.

Treatment

During World War I and the first years of World War II only from six to 10 percent of mental cases recuperated and returned to duty.

This meager product of therapeutic treatment caused the hospital facilities to be saturated with mental patients, transportation tieups, and pensions to soar. When it hampered the military efficiency of combat units, the general staffs, the commanders of armies, and the nations' executives issued orders to the medical services to increase their neuropsychiatric services, both in preventive and curative aspects.

It is not strange, then, that the unit commanders contributed to the success of these new medical missions. They stopped considering the soldier with initial mental reactions as a malingerer and the psychotic as a madman fit only to be locked up and isolated as if he did not have any hope of recovery.

As soon as this attitude was abandoned the psychiatrists and military doctors, in general, in the theater of operations' medical facilities started to make maximum use of such procedures as Pentothal intravenous injections, rest and prolonged sleep of two or three days, or electric or insulin shock. Different forms of psychotherapy, superficial or prolonged, individually or in groups, were used profusely.

These procedures produced the miracle of returning to duty, in a few days or

weeks, from 60 to 70 percent of the individuals with emotional disorders. Additionally, a large part of those who could not be returned to combat duty benefited from the various measures of physical and psychological rehabilitation, reeducation, and resocialization that were efficiently organized. Consequently, this raised to 90 percent the proportion of mental patients recuperated for the benefit of the Army or the society when they returned to civil life.

These results reveal not only the high degree of progress in the treatment of mental disorders, but particularly the effectiveness of coordination between commanders at all levels and their medical staff officers, thus enriching the science of war with the developments in medical technique.

Psychological Warfare

Psychological warfare is employed by modern armies as a powerful means of sapping the moral strength of both the enemy forces and the civilian population that supplies and sustains them.

Although military history shows how the great captains of the remote past employed different means to disorganize the enemy forces, or to raise the combat spirit of their own forces, it was not until this century and particularly during World War II that special departments or sections were established to deal with these psychological aspects. The results of their generally unpublicized work have been tremendously effective in undermining the enemy's will to fight and in spreading defeatism and panic among military and civilians. In other words, they were effective in producing mental derangement in the enemy.

Paradoxically, however, the armies developed only the destructive aspect of the psychological factors, and when war broke out they did not have defensive measures ready to counter the destructive psychological means employed by the adversary. This omission was corrected concurrently with the improvement achieved by the military medical services in the neuropsychiatric aspects of the prevention, treatment, and rehabilitation of mental disorders caused by war.

The experience gained in that field is being used to good advantage in the preparation of the defense for armies and civilian populations against psychological warfare.

Summary

Undoubtedly, the number of neuropsychiatric cases in time of war has increased in contrast with the reduction in other diseases which formerly played havoc with the armies.

The excessive number of mental patients during an armed conflict jeopardizes the military missions by lowering the morale, reducing the offensive and defensive capabilities of units, tying up transportation, and saturating medical facilities. Moreover, they constitute a great economic loss through wasted expenditures in training, clothing, food, equipment, destruction of material, and, in a special form, through the payment of disability pensions.

Mental disorders in fighting men result from predisposing factors in their constitutional makeup and family environment, and other contributing elements.

The recruiting system has been modernized to prevent mental disturbances in fighting men by studying the neuropsychic backgrounds of the candidates for recruitment and by mental tests designed not only to measure the general intelligence and mental aptitudes of candidates, but also tentatively to determine and grade the capacity to resist emotional tension.

Likewise, leadership plays an important part in the prevention of mental disorders. The leader must have an understanding of the positive or negative psychological influence that leadership itself exerts on subordinates. They constitute a family group in which the leader

represents the father whom everybody must obey, but of whom attention, interest, and just and rational treatment is expected.

Homesickness, a contributing factor of mental disorders, is reduced by the organization of efficient mail and special services. Religious services and passes or leaves to get away from the battle zone for days or weeks greatly reduce nervous tension, raise morale, and prevent major emotional disorders.

The well-organized treatment of mental patients and good coordination between commanders and medical service personnel will return to combat between 60 and 70 percent of the patients. In general, 90 percent of the patients recover, as opposed to from six to 10 percent during World War I.

International armed conflicts of this century are defined as total wars between nations. Psychological warfare aimed to undermine the fighting spirit of the army and civilian population of the enemy (psychological offensive) should be developed concurrently with the best possible treatment, both preventive and curative, of mental disorders of the fighting man and civilian population.

Missile-Carrying Submarines-- A New Factor of Strategic Planning

Translated and digested by the MILITARY REVIEW from an article by Hans Schoenenberg in "Wehrkunde" (Germany) May 1958.

The next step will be the development of a fleet of atomic-powered missile submarines which will, after a subsurface approach of more than 600 miles, sneak up close to the coast. At this relatively short distance from important targets, they will launch a medium-range missile with an H warhead from beneath the all-concealing surface of the sea.

This is the arm which will revolutionize sea warfare in the same way as the satellites prepare the way for aircraft that will fly inside our atmosphere as well as in space.

—Admiral H. G. Rickover

TODAY, the American Navy is in the middle of a major change from conventional to nuclear fuel. Only four and one-half years elapsed between the first theoretical drafts for an atomic-powered submarine in 1949, and the day the first atomic submarine engine was ready for use. A few months later the *Nautilus*, the first atomic-powered submarine, made her maiden trip. The second atomic submarine, the *Seawolf*, was ready in 1955; and the *Skate* was ready in the spring of 1957. The fourth and fifth, *Swordfish* and *Sargo*, were launched in August and October 1957, respectively. A total of 19 such ships are ordered; part of them are under construction. Four of these ships will be able to launch missiles. The *USS Growler* and *USS Grayback*, two conventionally powered submarines, are being reconstructed so that they can carry guided missiles inside their hulls. Actually, the United States only has two operational submarines able to launch guided missiles, the *SS Tunny* and *SS Barbero* which can carry one to two aerodynamic missiles of the

Regulus type in containers mounted on deck.

The *Regulus I*—in the Navy officially *SSM-N-8*—weighs 14,500 pounds, has a range of action of 600 miles, and a speed of about 600 miles an hour. The developmental work on the *Regulus* was started in 1947 and in full production by 1953. It can carry a nuclear warhead. Within 1958, the *Regulus I* will be replaced by *Regulus II*—in the Navy officially *SSM-N-9*—and, therefore, will become obsolete. *Regulus II* has a speed of Mach 1.9, weighs 23,500 pounds, and has a range of 1,000 miles.*

The wings of these aerodynamic missiles represent a disadvantage because they take considerable space within the very small hull of a submarine. The United States Navy, therefore, plans to introduce the ballistic missile *Polaris*. A submarine with atomic propulsion is able to carry 16 *Polaris* missiles; its delivery to the Navy has high-priority.

Developmental work also is completed on atomic motors for a cruiser, a carrier, and a frigate. These ships will be ready by 1960 and will be equipped to carry guided missiles.

American developmental work is aimed at the construction of atomic motors which would work for the duration of a possible war without refueling.

A principal objective of a future sea war will be the destruction of the enemy's submarines and bases, which can be done by bombers based on a nuclear-powered aircraft carrier. As for submarines surviving the bombing and escaping into the open sea, the US Navy plans the construction of nuclear submarine chasers.

Actually, the United States makes every

US Navy Photograph

Missile-carrying submarines present a new and important factor in strategic planning. Shown above, the *USS Grayback* firing a *Regulus II* missile.

* Since this article was written the *Regulus II* program has been discontinued.

possible effort to make up for the numerical lag behind the Soviet Union (in the case of submarines, the Soviet Union leads the United States by about six to one), with higher quality and higher technical perfection. The Navy considers the conversion from traditional to nuclear fuel to be the principal means to achieve this goal. The use of these fuels makes the fleet independent of tanker refueling. The entire nuclear fuel supply for the Navy can be stored in a few buildings. Surface vessels such as carriers will have a range of action 20 times greater, and light cruisers and frigates perhaps even 50 times greater than today.

With the conversion to atomic propulsion, the US Navy will have global striking power. Until this aim is attained, United States plans call for fast production of traditionally powered guided missile submarines, the relative radius of action of which is extended considerably by the addition of the radius of action of the guided missiles.

German Developments

The Soviet Union started the development of such subs 13 years ago when she occupied Peenemünde. Here, experiments were carried out with guided missiles that could be launched from under water, and 21-cm *Borsig* solid propellant rockets were launched from freestanding pads on deck. The ignition of the rocket was triggered from a control station inside the vessel. This type of rocket was combat-ready and has been highly improved by the Soviets since then. The second type was a submersible container from which an *A4* (*V-2*) missile could be launched. The work on both projects was started in 1944 at the Vulkan shipyards in Stettin under the code names *Projekt Schwimmweste* (Project "Lifejacket") and *Versuchsstand 12* ("Test Station 12"), and, naturally, was kept top secret.

The submersible launching devices had a control station, trim tanks, and tanks for liquid oxygen, alcohol, and water ballast. Complicated gyrosystems checked roll and yaw of the subsurface launching vessel. The container itself weighed 70 tons; the missile, with accessories and fuel, 35 tons; and the ballast 300 tons.

A submarine could tow three such containers with a full load at a speed of 15 miles per hour. With one container, the speed could be increased to about 20 miles per hour.

The range of action depended entirely upon the fuel capacity of the towing vessel. Fuel for the missiles was stored in vacuum-insulated containers which reduced losses of liquid oxygen to less than one percent.

When the Soviets got hold of these German experiments, the engineers of Peenemünde already had solved many difficult problems of the project. A major problem was the stabilization of the streamlined container for the launching. Large rudders, steered by a gyrosystem, were used for this purpose.

Another problem occurred in the creation of steam during the launching. Likewise, evaporating oxygen raised a problem in the fog-like clouds caused by its low temperature.

Problems Solved

Although Germany's armament industry was decreasing in effectiveness by the time these arms were in their experimental stage, in the two years of development, many problems had been solved. At any rate, the Soviets were given ample time to solve these and other problems of further development. The most difficult were connected with the complicated water-ballast pumping system, and with the electrical networks and switchboards for the pumps. The experiments with the *V-2* missile had yielded valuable experiences in the use of the complicated gyrosystem.

The crew of one container consisted of

three men. Firing could take place 30 minutes after the launching point had been reached.

Before launching, water was expelled from the upper ballast tanks by remote control. Thus the container rose into vertical position, but only its bow emerged from the water. The crew reached the container by means of an inflatable boat and made the electrical connections with the surfaced submarines. From the working platform and control center, the ventilation system was started to exhaust the fumes. Then the missile was fueled and made ready for the takeoff. After a last check of the control system, the crew left the container. The missile now was armed with warhead and fuze. The launching was triggered from the submarine by remote control.

After launching, the container could be left behind or towed back to the naval base.

The short radius of action of the German *V-2* missile—its major deficiency—was due to the 180-degree deflection of the exhaust jet by funnels in the launching container. This handicap was overcome by the Soviets through further developments of the *V-2's* found in Peenemünde, and through new inventions of their own.

Soviet Missiles

Today, the Soviet Union has five types of these missiles in use by the troops, or at least in preparation for immediate use. They are:

1. *T-1 (M-101)* is a medium-range missile that can be launched from submarines. It uses a liquid propellant rocket with an initial thrust of 77,000 pounds which gives it a speed of about 4,350 miles per hour and a range of 400 miles. Liquid oxygen and alcohol are used as fuels. The payload of the operational *T-1* is about two tons.

2. The *Comet-1*, with a solid fuel rocket of 50,000 pounds thrust, has a takeoff weight of about 10 tons. The payload of this ballistic and operational short-range missile is about 550 pounds.

3. The *Comet-2* is now being prepared for issue to the troops. This ballistic medium-range missile has a solid propellant rocket motor with 115 seconds combustion time, producing 99,000 pounds thrust. The warhead weighs 550 pounds; the range is said to be 620 miles, and the maximum speed about 5,600 miles per hour.

4. *Golem-1* is provided with a liquid fuel rocket motor that produces an initial thrust of 121,000 pounds using liquid oxygen and alcohol as propellants. The payload is about one ton, and the range is 400 miles. The missile is in serial production and in use by the Soviet armed forces.

5. *Golem-2* is still in the experimental stage. Fitted out with two liquid propellant rocket engines, it has a range of 1,200 miles. Nitric acid and alcohol serve as fuels. The weight of the warhead will be about one ton.

These missiles, employed in submarine operations, provide the Soviet naval forces with an offensive potential for the first time since the Battle of Tsushima. In World War II the Soviet Navy conducted no really significant operations. At the end of the war the Russian naval forces consisted entirely of their own obsolete ships and lend-lease units, the latter chiefly of United States origin.

The Fleets

Today, the Soviet Union has an efficient cruiser fleet, and her shipyards are so overloaded with warship orders that construction for civil navigation had to be handed over to foreign shipyards. With all her actual units, which are divided up into the Arctic Fleet, the Baltic Fleet, the Black Sea Fleet, and the Pacific Fleet, the Soviet Navy is considered to be second only to the US Navy—the strongest in the world. Actually, the Soviet Union has 600 submarines, which represent 50 percent of the planned strength of 1,200 units.

The United States has about 110 undersea vessels. Germany, at the beginning of World War II, had 57, of which only 22 of them were designed for long-distance assignments. The submarines, which at the present time are being built in the Soviet Union (about 22 per month), generally represent an improved form of the German *W* class which appeared late in World War II. These long-distance vessels were fitted with snorkels and a combination of diesel and electric engines.

Besides the boats of the *W* class, the obsolete types of the *Shcha* class are still in service, as are the boats of the *S* and *K* class. A recent addition, the units of the *Z* type, was developed from the former German submarine type *XXI*. The surface speed of these boats is 20 knots, the submerged speed about 11 knots.

So far, there are no reports about the Soviets having atomic submarines similar to *Nautilus*, *Seawolf*, and *Skate*. But there is every reason to assume that the Russians are hard at work on such projects. There also are construction projects on conventionally powered engines for submarines similar to the American high-speed submarine *Albacore*, and the *SSN-585 Skipjack* of the *Sargo* class. The work on these projects is being pushed ahead with considerable diligence.

Submarines which have stealthily approached the enemy's coast after long-subsurface cruising are difficult to discover from the air or by surface vessels. With the new modern techniques they are able to launch a medium-range missile from beneath the water surface and guide it, either program-controlled or radar-controlled, with supersonic speed to the target. In conjunction with such modern arms, the submarines of today constitute an essential factor which should not be underestimated in global strategic planning.

To exploit the advantage of the sea, the Navy launched its program to develop the fleet ballistic missile, *Polaris*, which will be deployed on submarines where they can be kept hidden and moving at sea.

These missile-launching submarines will be most difficult to locate for surprise attack. The Soviets will never know from one day to the next where these submarines are, but they will know they are somewhere in the depths of the sea, ready to launch their missiles, should the Communists venture to initiate all-out war.

The Soviets are well aware that they will be unable to neutralize these missile systems with one massive attack, hence they know that to initiate war will mean suicide for them.

This is a major contribution to the deterrence of general nuclear war. Whatever may be the developments of the future in long-range mass destruction weapons, on both sides in the world struggle, the fleet ballistic missile system will continue to exploit the basic advantage of mobility and dynamic dispersal. Any attack against them will force the enemy to go to sea, not come to our own homeland, to attack our missile systems.

Admiral Arleigh A. Burke

BOOKS OF INTEREST TO THE MILITARY READER

BAA BAA BLACK SHEEP. By Colonel Gregory "Pappy" Boyington. 384 Pages. G. P. Putnam's Sons, New York. $4.50.

BY COL MALCOLM O. DONOHOO, *USMC*

"Pappy" Boyington (Colonel Gregory Boyington, United States Marine Corps, Retired) has in this autobiography come up with three fast-paced, absorbing adventure stories based on his widely publicized World War II experiences. In chronological sequence he tells the exciting stories of his service with Chennault's Flying Tigers in China, his exploits as skipper of the Black Sheep Squadron of Marine *Corsair* fighters in the Solomons Campaign (for which he was awarded the Navy Cross and Congressional Medal of Honor), and his ordeal as a prisoner of the Japanese.

From the beginning of his career in the Marine Corps through all the action-packed years during and following the war, Boyington found himself in and out of trouble because of emotional characteristics. His struggle to overcome these traits is described in a forthright manner without sparing himself or glossing over his shortcomings.

"Pappy's" views on Chennault, the Gimo and Madame Chiang, many of his wartime contemporaries, and his present attitude toward his Japanese captors are interesting if unorthodox. Throughout the book, however, regardless of the ofttimes extremity of the views expressed, the reader will be impressed by the complete sincerity of the author.

THE SAMURAI SWORD. A Handbook. By John M. Yumoto. 191 Pages. Charles E. Tuttle Co., Rutland, Vermont and Tokyo, Japan. $3.75.

BY MAJ JOHN R. D. CLELAND, *Inf*

Through the mist and fog of great antiquity, there remain the Three Sacred Treasures of Japan, which are still held in reverence by the people: The Sacred Mirror, the Comma-Shaped Beads, and the Sword—the three most highly prized national treasures in Japan.

The author states that there are more samurai swords in the United States today than there are in Japan. An estimated 250,000 to 350,000 swords have been brought into this country as souvenirs by returning servicemen.

This handbook is the first complete work on the samurai sword in English and discusses the origins of the sword, its development and historical background, the various types of swords, their component parts, differences in styles and construction, the art of the swordsmith, the problem of identification and evaluation, and the care and maintenance of the sword.

The book is well-written, organized in an interesting and logical manner, and profusely and well-illustrated.

Mr. Yumoto's book will be of interest only to those who own a samurai sword and want detailed knowledge of their own blade or to those who desire comprehensive and technical knowledge of the Japanese samurai sword and the swordmaker's art.

ARMS AND THE STATE. By Walter Millis with Harvey C. Mansfield and Harold Stein. 436 Pages. The Twentieth Century Fund, New York. $4.00.

BY COL RODGER R. BANKSON, *Inf*

The civil and military elements in our society have become so deeply intermeshed that neither the uniformed officers nor the administrative bureaucracy nor the representative legislature speak from any firm, independent position of principle or policy.

Since 1945 the traditional fear that civilian control might be forfeited to the military has been irrelevant. In 1945 the national leadership included civilians more militaristic than the military and military men—like Marshall, Eisenhower, Bradley, and many others—with a breadth of view on national and world problems which often made them seem more "civilistic" than the civilians.

Old arguments over the proper position of the civilian and the military power in the state structure are meaningless. Powerful events have exerted their influence to shape the modern democratic state into a monolithic structure which still pursues the twin objectives of providing for the common defense and promoting the general welfare. The trouble lies in the fact that international isolation is no more and it is not possible to separate the two objectives, particularly in this day when the common defense is a matter of immediate urgency. A new, proper, and effective relationship between the military and nonmilitary factors of national life is essential—and it will take imaginative mental pursuit of new theories and organizations to develop such an organization and to direct its efforts in support of national policy.

From its founding in 1919 the nonprofit Twentieth Century Fund concentrated on economic research and education until, in 1951, it turned to an increasingly important contemporary problem—civil-military relations. This book testifies to the wisdom of this new interest. It is excellent reading for any military man who would preserve his broad outlook and sharpen his understanding of the composition, force, and direction of national policy.

Principal producer of this volume is the respected author, Walter Millis, whose *Arms and Men* is a prominent entry on the Army's recommended Contemporary Military Reading List, 1958.

ALLIED INTELLIGENCE BUREAU. By Colonel Allison Ind. 305 Pages. David McKay Co., Inc., New York. $4.95.

LT COL JOSEPH F. DUNN, *Arty*

The book contains a splendid description of the functioning of a high-level intelligence office during the war with Japan. For the reader interested in viewing General MacArthur's Pacific campaigns from the perspective of a theater level intelligence staff agency, it is an extremely interesting document.

The campaigns of the Solomons, New Guinea, New Britain, and the Philippines serve as the report's background. The agency mission was to "obtain and report information of the enemy in the Southwest Pacific Area and where practical weaken the enemy by sabotage and destruction of morale." The author, who was the deputy director of the agency, makes it a living, vital, compelling tale. It is liberally laced with many examples of rugged courage displayed by the numerous operators deployed throughout the contested islands.

The Coast Watchers of the Solomon Islands as well as the Commandos of Singapore harbor are skillfully linked to a compelling requirement of Supreme Headquarters—contributing to its own security by procuring enemy intelligence.

Here is a unique G2 view of SWPA activities by an officer who actually experienced the operations.

BOY ON THE ROOFTOP. By Tamas Szabo. Translated from the French by David Hughes. 180 Pages. Little, Brown & Co., Boston, Mass. $3.75.

BY MAJ CHARLES M. SIMPSON, III, *Inf*

The Hungarian Revolution that started in Budapest on 23 October 1956 has been the subject of considerable speculation by thinkers in the Western World. There are those who believe that this violent uprising cost the Soviet bloc 160 divisions—the 80 satellite divisions plus the 80 Russian divisions that must forever watch them. Others believe that the once-potent weapon of Communist ideology was revealed as nothing more than a tool of the masters of the Kremlin, and henceforth must be a hollow organizational farce.

Another less optimistic group dwells on the aspects of Western failure to support the Hungarian insurgents effectively. Certainly, it is true that there is evidence to support all three of these viewpoints in this book written by a 15-year-old Hungarian schoolboy insurgent who fought in Budapest throughout the 18 days of revolution.

Perhaps the most incredible fact concerning this book is that it was written at all. As a *Sten*-gun carrying leader of fighting schoolboys, the author took part in numerous small-arms duels, attacks on Russian tank columns and troop concentrations, and fanatical defenses of insurgent-held apartment buildings against coordinated attacks by Russian infantry.

As exciting as this seems, the chief merit of *Boy on the Rooftop* lies in its claim to be an original source on the motives and actions of that element of the Hungarian population that actively fought the Hungarian Secret Police and the Russian divisions.

Despite its shortcomings, however, this book is worthy of a long second look. Much can be learned concerning the effectiveness of regular troops supported by armor fighting a determined irregular force on ground of their own choosing. An insight into the attitude of the masses under the domination of the Soviets and their disaffection may be gained from the words of Tamas Szabo. In short, the Hungarian Revolution was too important an event for us to let pass any source that might help our understanding of its true relationship to that which has gone before and that which is to come.

PRINCESS PATRICIA'S CANADIAN LIGHT INFANTRY 1919-1957. Volume III. By G. R. Stevens. 411 Pages. The Historical Committee of the Regiment, The Hamilton Gault Barracks, Griesbach, Alberta, Canada.

This is a detailed chronological history of the Patricias from the end of World War I to the present. It will be of especial interest to those who have served in joint operations with this famous unit.

BUILDING A WELFARE STATE IN BURMA 1948-1956. By Frank N. Trager. 118 Pages. Institute of Pacific Relations, New York. $4.00.

Since Burma became a federally organized constitutional republic in early 1948, considerable progress has been made toward the creation of a balanced economy. The task is stupendous, not only because of the damage of World War II and the civil war which followed, but Burma does not yet possess the technical administrative and financial resources necessary for building a modern technological economy.

However, today, through its own efforts and foreign assistance the nation is further along the path of rehabilitation and development than many people considered possible during the critical days of 1949-50.

This book presents the story of Burma's progress in a carefully annotated and very readable form.

THE SCHLIEFFEN PLAN. By Gerhard Ritter. Introduction by B. H. Liddell Hart. 195 Pages. Frederick A. Praeger, Inc., New York. $5.50.

BY LT COL CHRISTOPHER R. KEEGAN, *Inf*

This book is the first to cover, in its entirety, the original text of the Schlieffen Plan. Here is an objective and thorough analysis of a plan, that for two generations has been a myth, embodying one of the chief mysteries and "if's" of modern times. The book clears up the great "if" in a work of outstanding historical importance, not only of interest to the military historian, but also extraordinarily interesting and fascinating to read as the author's "piece by piece" analysis dispells the magic of the plan for the general reader.

The author is recognized internationally as one of Germany's distinguished historians. It was through his efforts that the Schlieffen papers were unearthed in the American Archives in Washington. It was fortunate that the documents came into his hands.

He presents the full text of Schlieffen's military testament, and the relevant parts of drafts and other memoranda which shed light on the evolution of the plan. They are preceded by the author's masterly exposition of their content.

The significance of the plan and its historical impact on European politics and the balance of power between 1891 and 1905 add an illuminating effect to this "historical detective story."

The plan has become the center of every discussion about the role of the German General Staff before 1914, and the question of German "militarism." Thus it is a study of not only a plan, but of strategy, European politics, and presents a portrait of Graf Schlieffen as a man and as the holder of his office, Chief of the German General Staff.

THE SOVIET NAVY. Edited by Commander M. G. Saunders. 340 Pages. Frederick A. Praeger, Inc., New York. $7.50.

BY MAJ HOWARD H. BRAUNSTEIN, *Armor*

The Soviet Navy in ten years has risen from comparative unimportance to a position second only to that of the United States in immediately available offensive and defensive power.

A distinguished international team of 18 contributors from 11 different countries of origin, between them cover every aspect of Russian naval affairs. They provide the first comprehensive account of the Soviet Navy today.

This book leaves little doubt in the reader's mind as to the implication of the part of Soviet seapower in the geopolitical aspects of Soviet imperialism from Peter the Great to the modern Soviet naval arm.

Various chapters discuss the broad lines of Russian naval strategy and the nature of the threat which it poses to the West. Other chapters review the different branches of the Russian Navy, and discuss in detail such questions as the intended use of the vast new submarine fleet (including the possible use of submarines as missile carriers), the role of the naval air force, the reason the USSR has built no aircraft carriers, and the political control of the navy.

The free world is a seapower. In nuclear as in conventional war the sea permits one to launch his offense from a distant frontier, initiate attack close to the enemy, and, therefore, increase chances of success. The sea under friendly control allows the free world to support itself and denies overseas expansion by the "heartland" nations.

A knowledge obtained from this book of the strategic, geopolitical, and technological implications of Soviet seapower is indispensable to any understanding of East-West relations. It is an excellent contribution to any military library.

THE FOUNDING OF THE FEDERAL REPUBLIC OF GERMANY. By John Ford Golay. 299 Pages. The University of Chicago Press, Chicago, Ill. $5.00.

BY LT COL HOWARD L. FELCHLIN, *Inf*

As the past 100 years of German history have been tumultuous times, it is a hard task to analyze and evaluate dispassionately the course of past events. Having instigated two World Wars, the German nation and its people have been indicted time and again for their alleged crimes against civilization. But in retrospect, and after calm reflection, is this indictment justifiable? Are there not German people of high moral courage, possessing a strong desire for truth, justice, and peace, who will establish for Germany a respected and permanent place in the family of free nations?

John Golay carefully has investigated these two problem areas and concludes that in the future "Western Germans will act with a due sense of responsibility to their neighbors and of the need to keep the peace."

In support of his viewpoints the author has carefully studied considerable documentary material pertinent to the evolution of the Federal Republic of West Germany from the London Conference of February 1948, when the allied powers decided to establish a West German central government, through the year 1950.

The author has done a commendable, scholarly job in analyzing the structure of the West German Federal Government, the political parties, electoral law, and basic rights of the German people.

The issues of reunification and Germany's future political relationships with the Western World *and* the Soviet Union are two vital problems that remain to be solved. In the light of their auspicious record of recent years, the German people have indicated they will be equal to the task.

THE SPLENDID LITTLE WAR. By Frank Freidel. 314 Pages. Little, Brown & Co., Boston, Mass. $8.50.

BY LT COL ROBERT M. WALKER, *Arty*

The dramatic story of the almost forgotten Spanish-American War is told here in graphic text and glowing pictures. It is a thrilling documentary of a war that began as a crusade and lost its innocence in the mud, death, and disillusionment from Santiago to the Philippines.

Told in a large part in the words of the men who were there and did the fighting, and the famous correspondents who wrote about it, this book points up the fact that to the men who fought in it, this was as bloody and heroic a war as any in history.

The now-famous charge up San Juan Hill is portrayed as a battle that fought itself, successful in spite of the bungling inefficiency of the high command. The sortie of the Spanish Fleet and the overwhelming victory of the United States Fleet are recorded in the words of the participants. The mistakes and the triumphs are painstakingly and objectively reported.

This volume is outstanding as a record of the first major war to be covered in detail by war correspondents. Additionally, the more than 300 photographs and line drawings made on the spot by noted artists—Remington, Christy, Glackens, and others—add to the interest of the narration. Here is a book of absorbing interest to both the military historian and the lay reader.

The Spanish-American War may seem to some a "Splendid Little War" in retrospect, but to those who fought in it, it was just like any other war, more dirt than fun, more sweat than glory.

SERVICE ETIQUETTE. By Rear Admiral Bruce McCandless, United States Navy, Retired; Captain Brooks J. Harral, United States Navy; and Oretha D. Swartz. 365 Pages. United States Naval Institute, Annapolis, Md. $5.50.

SPRING IN OCTOBER. The Polish Revolution of 1956. By Konrad Syrop. 207 Pages. Frederick A. Praeger, Inc., New York. $4.50.

The evening of 21 October 1956 marks the moment that the Polish revolution came into being in its fullest force.

Spring in October describes events which took place in Warsaw which up to now have been little known in the West. A gradual buildup within Poland which cannot be attributed to one man or a group of men made possible the return of Gomulka to power. This stands out as the only victorious rebellion against the dictates of Moscow since Tito's break in 1948.

With the Polish nation's hopes centered upon one man, Gomulka, the free world will watch and wait for the final outcome of Poland's move as a Communist state surrounded by Soviet might.

THE AMIABLE PRUSSIAN. By Charles Drage. 196 Pages. Anthony Blond Ltd., London, England. $2.52.

BY LT COL JOHN K. WALKER, JR., *Armor*

Biographer Drage has woven the story of a colorful individual into a tale which reads like fiction, yet is informatively factual. With the backdrop of the personal and public life of a loyal German soldier-citizen, the book objectively discusses interesting sidelights from many of the major events from 1895 to 1957. As a result, the personality, loyalties, and accomplishments of Walther Stennes emerge.

He entered into active army service with the 16th Westphalian Infantry in 1914, and emerged from World War I with a well-known and enviable battle record. In the years following he continued the fight against the enemies of his country.

Stennes had approximately the same close relationship with Hitler as did Goebbels and Göring. Had they not come to disagreement over treatment of the Brown Shirts, Stennes (who commanded a large segment of the Brown Shirts) might have risen high with the tide of the Nazi Party. However, in 1933 he opposed Hitler for not spending more money on his beloved troops and was exiled from Germany and from Europe. He took advantage of a previous offer, moving to China to become commander of Chiang Kai-shek's body guard. In addition, he performed a variety of other tasks from designing movable pillboxes to commanding the Generalissimo's Air Transport Squadron.

Almost devoid of tact, fanatically uncompromising, highly courageous, and superbly loyal to his subordinates, Walther Stennes rises from the pen of Charles Drage as one of the almost-great of his generation.

Drage writes adroitly and accurately. As a consequence, this biography serves as a delightful and interesting review of the ascent to power of the Nazi Party in Germany and the Communist Party in China.

THE HELICOPTER. By Jacob Shapiro. 269 Pages. The Macmillan Co., New York. $4.50.

BY CAPT BILLY M. VAUGHN, *Inf*

Did you ever wonder what makes a helicopter tick? *The Helicopter*, a book by a noted helicopter designer, gives the answers in a nontechnical language that the layman understands.

Mr. Shapiro presents a concise, readable discussion of the design and functioning of the helicopter and explains the principles of vertical flight. Additionally, a well-illustrated summary of current helicopter types and their uses is presented.

The inclusion of the history of helicopter development and a look into the future of this type aircraft add interest to this otherwise rather cryptic book.

Readers interested in aviation in general should enjoy this short book.

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Mayor General,
Ministerio de la Defensa Nacional,
Caracas.

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